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PROTECTIVE ACTION OF NUCLEIC ACID ON THE LIVER IN CARBON TETRACHLORIDE POISONING*

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Various substances have been credited with having a protective action on the liver. It was reported by Opie and Alfred (1913) that fats increased the susceptibility of rat to chloroform; but on the other hand carbohydrates were found by Graham (1915) to protect the liver against chloroform. Davis and Whipple (1919) found that in starving dogs chloroform produces a more deleterious action on the liver than in dogs fed with either proteins or carbohydrates; but they did not state that glycogen itself has a protective action. Davis (1923-24) suggested that glucose exerted a protective action on the liver; but Chandler and Chopra (1926) in their experiments on dogs could not demonstrate any protective action from the administration of sugar before carbon tetrachloride. Von Glahn and Flinn (1939) from their investigation on the action of lead-arsenate on the liver found that the presence of glycogen in the liver did not influence the changes in the parenchyma. Graham (1920) believed that sodium bicarbonate lessened the susceptibility to chloroform poisoning. Minot and Cutler (1928) demonstrated that a high calcium diet in dogs helped them to withstand carbon tetrachloride toxæmia; but the extent of liver damage was not reduced. Wokes (1933) did not find that a high calcium diet exerted any protective action in mice against carbon tetrachloride.

In recent years the importance of choline in the diet to prevent the fatty infiltration of livers due to damage by chloroform or carbon tetrachloride has been emphasized by Best, McLean and Ridout (1935), Barret, Best, McLean and Ridout (1939-40) and others. However, they do not state that choline protects against liver damage or that it can prevent necrosis of the liver cells. Forbes, Neale and Scherer (1936) found that large doses of choline did not protect the liver against carbon tetrachloride and chloroform.

Of more interest is the claim made by Sato (1926) of a liver harmone "yakriton" prepared from ox liver which prevented necrosis of liver cells. Later Forbes, Neale, and Scherer (*loc. cit.*) prepared a liver extract which reduced the susceptibility of rats to carbon tetrachloride and chloroform. Forbes and McConnell (1937) identified the specific substance as sodium-xanthine. Further experiments by Barrett, McLean and McHenry (1938) confirmed this observation. Fitzbugh (1939) found that sodium xanthine exerted a protective action on the liver against carbon tetrachloride; but there was no evidence that it stimulated the regeneration of liver cells after damage. Ravdin, Goldschmidt and Vars (1939) from their experiments found that sodium xanthine was not a specific protective agent, and that the process involved was a stimulation of the protective mechanism secondary to the tissue necrosis at the site of injection. Forbes and Outhouse (1940) observed that the injection of sodium xanthine, sodium ricinoleate and tricalcium phosphate caused a reduction of serum esterase concentration which increased the resistance of the liver to toxins.

Paul, Gyorgy and Goldblatt (1939) found that rats fed on a diet lacking only in yeast eludate or yeast extract developed liver necrosis. They observed also that the diet was deficient in purine bases. Rich and Hamilton (1940) demonstrated that rabbits fed on a diet which was wanting only in yeast developed cirrhosis. They suggested that the lesion was due to the lack of a specific type of protein present in the yeast. Neale and Winter (1938) observed that besides sodium xanthine, other purine bodies including guanosine, guanine, hypoxanthine and uric acid exerted a protective action on the liver.

In the present study it was decided to administer nucleic acid orally to albino rats in order to eliminate the additional factor of a local and general reaction which follows subcutaneous injection, and to observe if it will have any protective action on the liver of these animals.

MATERIAL AND METHODS OF STUDY

In this experiment 28 albino rats were employed of which 14 were experimental animals and 14 were controls. Of these, 6 experimental and 6 controls were growing rats weighing between 75 gm. and 125 gm. Fourteen experiments were carried out on

This experimental work was carried out in the University of Edinburgh during the period 1939 to 1941 and formed part of a thesis on "The Studies on Infantile Cirrhosis of the Liver, and on the effect of cirrhogenic toxins on the Progeny." Abstracts from the thesis were published in the *J. Path. & Bact.*, **54**: 289-296, 1942 under the title "An Experimental Study on Placental Permeability to Cirrhogenic Poisons," and in the *J. Indian M. A.* **16**: 335-340, 1947 under the title "The Relation between Infantile Cirrhosis of the Liver and a Diet of Polished Rice." The expenses of this research were defrayed by the Moray Endowment Fund of the University of Edinburgh.

the whole. Each experiment included the observation of the result of carbon tetrachloride toxæmia on a control rat of more or less the same weight and kept under identical conditions in the same cage. In the experimental animals nucleic acid in the form of sodium nucleinate dissolved in distilled water was administered by means of a stomach tube in a single dose, or on consecutive days depending on the dosage of the nucleic acid. A maximum of 0·5 gm. in 2 c.c. of distilled water can be given at a time; but larger doses had to be given on successive days. Forty-eight hours after the last dose carbon tetrachloride was injected subcutaneously in doses varying from 0·5 c.c. to 0·1 c.c. per 100 grams body weight. The control animals were injected with the same dose of carbon tetrachloride at the same time. The animals tolerated these single large doses of carbon tetrachloride well; while a much smaller dose at frequent intervals killed the animals. It is also probable that the ability to withstand these large doses as compared with that of Cameron and Karunaratne (1936) was due to the diet of dog biscuits which contains a large percentage of horse flesh. Injections of carbon tetrachloride on a full stomach also seem to reduce the extent of necrosis in the liver. The animals were killed 48 hours after the injection of carbon tetrachloride and the livers were fixed in 10 per cent formol-saline. Sections from paraffin blocks were stained with Mayer's hæmalum and eosin for routine study. Frozen sections were stained with Sudan III, and counterstained with hæmatoxylin for fat. In the sections the proportion of necrotic areas to healthy areas were calculated in all the experiments with acute toxæmia. The image of the sections was projected on graph paper, and the necrotic areas were marked out in pencil. By counting the number of squares in the necrotic and healthy areas the proportion of each was ascertained. For each section, a minimum of five fields were studied.

Result

Toxic doses of 0·25 to 0·5 c.c. of carbon tetrachloride per 100 gramme body weight produced changes in the control as well as in the experimental animals which varied in degrees. The livers were markedly enlarged, inelastic and soft; but they were more so in the case of control animals. The surface was uneven, and pale yellow in colour with red mottling.

Microscopically the liver of the control animals exhibited central necrosis of varying degree characterized by a homogenous or vacuolated cytoplasm which took a pink stain with eosin and karyorrhexis and lysis of many of the nuclei. The extent of necrosis varied in each liver and such areas were fringed by a single layer of cells showing marked hydropic degeneration. The Kupffer cells were swollen and prominent with pyknotic nuclei and faintly stained cytoplasm. The sinusoids were in many cases distended with red cells and the central veins were seen to have ruptured in a few livers. The peripheral zone of cells were well preserved especially those which were nearest to the portal canal. The portal vein, hepatic artery and bile duct were healthy.

The liver of the experimental animals which received the same dose of carbon tetrachloride showed a different picture under the microscope. Compared to the controls the extent of necrosis was much less and in a few it was localized to a narrow margin of cells round the central vein. The characteristic feature in many of the livers was the striking increase of mononuclear cells in the centre of the lobule. It was difficult to state with any certainty if these were proliferated Kupffer cells or histiocytes of other origin. No polymorphs as observed by Bollman and Mann (1931) in their experiments on dogs were noted in these cases. Sometimes a few lymphocytes were seen in the cellular infiltration. Congestion of the vessels was not a marked feature in these livers. A large percentage of the cells were well preserved and took the normal bluish pink stain. No abnormal increase in the mitosis of liver cells was observed. The Glisson's sheath frequently showed some infiltration with mononuclear cells.

In those experiments where the controls as well as the experimental animals received carbon tetrachloride in doses of 0·2 c.c. or less, per 100 grams body weight no enlargement of the livers were observed when compared with Hatai's chart 3 (1913) for estimated normal weight of the liver. It is possible that the nature of the diet plays a part in the fluctuation of the weight of normal liver. However, when compared with the experimental animals, the livers of the control animals usually showed greater weight.

Microscopically the control livers showed varying degrees of necrosis, hydropic degeneration and fatty change in the parenchyma. The necrosis was usually confined to a small area in the centre of the lobule; the rest of the central and part of the middle zone were frequently the seat of extensive fatty change. In some, marked congestion of the distension of the central veins and the sinusoids were the chief features.

In the experimental animals degenerative and necrotic changes were seen less frequently. Moderate fatty changes were observed in many livers; and a few did not show any abnormal change in spite of the large dose of carbon tetrachloride. Cellular infiltration with mononuclears was frequently observed, especially around the central veins, and sometimes in the Glisson's Sheath as well. Mitotic figures were not more frequently seen than in normal livers.

Discussion

Paul, Gyorgy and Goldblatt (*loc. cit.*) observed that many of the rats which were fed on a synthetic diet containing all the essential vitamins developed necrosis of liver cells, and cirrhosis. They noted that the diet was wanting in yeast as well as in purine substances. The addition of yeast extract prevented such necrosis. A similar observation was made by Rich and Hamilton (*loc. cit.*) in the case of rabbits. Von Glahn, Flinn and Keim, (1938) found that yeast produced the incidence of hepatic cirrhosis in rabbits, produced by ingestion of lead arsenate. However they were not able to state what the protective substance in the yeast may be. Chaikoff, Conner and Biskind

(1930) were able to produce fatty infiltration of the liver and cirrhosis in depancreatised dogs kept alive for 2·6 to 5·5 years with insulin injections. On the other hand Kaplan and Chaikoff (1937) found that the addition of pancreas to the diet of these dogs will prevent as well as cure the fatty infiltration of the liver. Channon and Wilkinson (1935) have proved that a low protein intake produces fatty livers in rats. The question arises whether in the depancreatized dogs it is the interference with the absorption of proteins that is responsible for the liver damage or if there is a specific factor in the pancreas fed to the dogs that prevents the injury. If it is considered that there is a specific substance in the pancreas, the richness of nucleic acid in the pancreas is of special significance. Nakahara Fujiwara and Mori (1939) noted a certain geographical similarity in the occurrence of beriberi and hepatoma in man. Their experiments on albino rats fed on polished rice and subjected to the action of dimethylaminoazobenzol or butter yellow demonstrated that yeast feeding caused some inhibition of liver cancer development, but it was slight when compared to the effect of liver feeding. They also found that large doses of vitamin B_1 did not in any way influence beneficially rats fed on polished rice and subjected to the action of butter yellow.

It will be noted that in all the above mentioned experiments there was a complete absence of purine substances in the diets tried, and the articles of diet such as pancreas, meat, yeast and liver which prevented such damage were rich in nucleic acid content. The experiments in the present study were carried out in order to ascertain how far nucleic acid by itself will be able to protect the liver against carbon tetrachloride toxæmia. Nucleic acid was found to protect the liver of adult, as well as growing rats against damage in these experiments.

The question whether or not animals can synthesize the purine derivatives needed for nucleic acid formation has not been so far satisfactorily answered. Robertson (1928) from his experiments on white mice found that the oral administration of thymic nucleic acid and yeast nucleic acid enhanced their longevity, the prolongation being 12½ per cent of normal duration for males and 17 per cent for females with thymic nucleic acid and slightly greater with yeast nucleic acid. This experiment indicates that at least adult animals are not able to synthesize the optimum amount of nucleic acid. Ackroyd and Hopkins (1916) found that when arginine and histidine were together removed from the diet of rats which had been previously growing on a complete amino-acid mixture there was a rapid loss of body weight. This demonstrates that rats are not able to synthesize the necessary purines from a carbohydrate diet. The production of cirrhosis in rats by Gyorgy and Goldblatt (1939), and in the rabbit by Rich and Hamilton (*loc. cit.*) may be due to the fact that rabbits as well as rats during certain period of their life at least are not able to synthesize nucleic acid from casein to protect their liver against naturally occurring intestinal toxins.

Nucleic acid has been used frequently in the production of leucocytosis experimentally and to some extent therapeutically. Since the isolation by Jackson (1924) of nucleotides in the circulating blood the conception that nucleic acid stimulates the bone marrow in the production of leucocytes has been strengthened. Antoncich (1926), Doan (1926), as well as Sabin and Doan (1927-28) held the view that the action is a true stimulation whereas others believe that its action is that of a chemotactic substance exciting the discharge of white cells from the bone marrow. The consensus of opinion seems to favour the view that it is a growth stimulating factor influencing the maturation of the leucocytes. Funk, Lyli and McCaskey (1911) ascertained by experiments that yeast by itself was not of much value as food; the same remark must apply to nucleic acid also.

Furthermore, it was found in these experimental studies that, in those animals which were given large doses of nucleic acid, mobilization of histiocytes in the affected area of the liver was rapidly carried out, and the cells were also more numerous when compared with the controls. It is possible that the rapid production of mature white cells under the influence of nucleic acid may be a factor in the detoxication of carbon tetrachloride, with the result that the injury to the liver is lessened. However it is as yet difficult to specify the exact mechanism of the protection furnished by nucleic acid against liver injury due to toxins.

The studies of Paul, Gyorgy and Goldblatt (*loc. cit.*) as well as those of Rich and Hamilton (*loc. cit.*) demonstrate that cirrhosis in animals may be solely due to dietary deficiency. The question whether or not an abnormal toxic factor plays a role in the genesis of cirrhosis of the liver or if this second factor is a naturally occurring intestinal toxin, is a moot point. Whatever may be the nature of the toxin it is demonstrated by these experiments that its action on the liver is controlled by the ingestion of a substance rich in nucleic acid.

Summary

I. Oral administration of nucleic acid to experimental rats 48 hours prior to the injection of large doses of carbon tetrachloride had the effect of reducing the extent of liver damage as compared with that seen in control animals.

II. Infiltration of the centre of the lobule and the portal canals with mononuclears was an outstanding feature in the livers of many of the experimental animals.

III. Based on the above experimental findings it is justifiable in presuming that the addition of foodstuffs rich in nucleic acid will exert a protective action in cases of liver damage due to toxins in the human liver also.

Acknowledgment

The author desires to thank Professor A. Murray Drennan for the advice and guidance he gave in this work, Professor D. Govinda Reddy for his helpful criticism and Mr. T. C. Dodds for the microphotographs.

TABLE—SHOWING PROTECTIVE ACTION IN (1) GROWING RATS AND (2) ADULT RATS DUE TO THE ORAL ADMINISTRATION OF NUCLEIC ACID AGAINST CARBON-TETRA-CHOLRIDE TOXAEMIA

	Exper. No.	E=Experiment C=Control	Animal No.	Nucleic acid in grams	Carb. T. chl. in c.c. per 100 gm. body wt.	Body wt.	Wt. of liver in grams	Estimated normal weight in grams	Wt. ratio to normal	Per cent of necrotic area
GROWING RATS	1.	C_1	B_1	—	0·15	75·5	5·5	4·9	1	41
		E_1	A_1	0·5	0·15	75·2	5·2	4·9	1·1	34
	2.	C_2	B_2	—	0·15	78·6	5·5	5·05	1	24
		E_2	A_2	0·5	0·15	80·1	6·1	5·1	1·2	20
	3.	C_3	B_3	—	0·1	100·5	7·1	6	1·2	*
		E_3	A_3	0·4	0·1	83·5	4·3	5·25	0·8	*
	4.	C_4	B_4	—	0·1	100	8·2	6	1·4	*
		E_4	A_4	0·4	0·1	80·2	4·1	5·1	0·8	*
	5.	C_5	B_5	—	0·1	125	6·0	7·1	0·8	*
		E_5	A_5	0·6	0·1	120	5·3	6·9	0·8	*
	6.	C_6	B_6	—	0·1	112	5·4	6·6	0·8	32
		E_6	A_6	0·6	0·1	110	5	6·5	0·7	18
ADULT RATS	1.	C_7	76	—	0·5	240	15·5	11·45	1·4	33
		E_7	77	1·0	0·5	220	12·7	10·35	1·2	13
	2.	C_8	82	—	0·25	245	15·1	11·5	1·3	51
		E_8	81	1·2	0·25	300	20·1	13	1·5	25
	3.	C_9	92	—	0·25	146	7·1	8	0·9	34
		E_9	91	0·3	0·25	143	8	7·8	1	14
	4.	C_{10}	101	—	0·2	201·5	11·4	10	1·1	*
		E_{10}	103	1	0·2	203	9·5	10	0·95	*
	5.	C_{11}	104	—	0·2	149·5	8·4	8·1	1	*
		E_{11}	102	1·2	0·2	150	7·1	8·1	0·9	*
	6.	C_{12}	106	—	0·2	152	8	8·2	1	*
		E_{12}	105	0·9	0·2	148	7·9	8·1	1	*
	7.	C_{13}	110	—	0·2	147	7·6	8·05	0·95	*
		E_{13}	111	0·5	0·2	148	6·4	8·1	0·8	*
	8.	C_{14}	112	—	0·2	149	7·3	8·1	0·9	*
		E_{14}	113	1·8	0·2	148	6·2	8·1	0·8	*

* It was not possible to estimate the percentage of nec rotic area in these livers as the line of demarcation between the healthy and necrotic area was indistinct.

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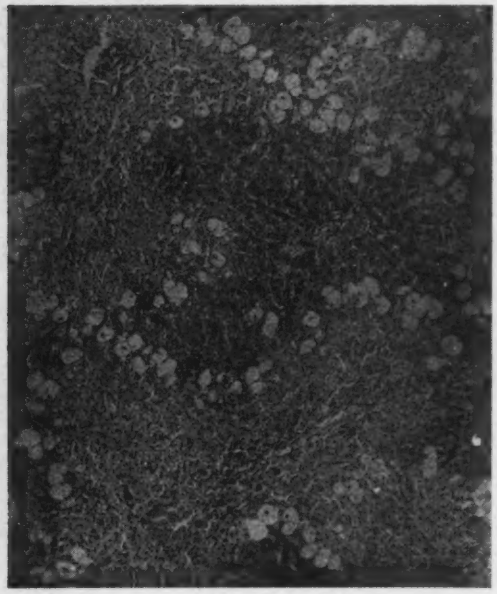

FIG. I—Liver of control rat 76 which had received an injection of 0 5 c.c. of carbon tetrachloride per 100 gm. body weight. Liver shows extensive necrosis affecting 33% of the lobule. A single layer of hydropic cells separates the normal from the necrotic cells. Very few inflammatory cells are seen in the necrotic area.

FIG. II—Liver of rat 77 which had been administered orally 1 gm. nucleic acid in two doses 48 hours prior to an injection of 0·5 c.c. of carbon tetrachloride per 100 gm. body weight. Approximately 13% of the lobule is necrotic. The necrotic debris is infiltrated with numerous histiocytes.

FIG. III—Liver of control rat 82 which was injected with 0 25 c.c. of carbon tetrachloride per 100 gm. body weight. 51·1% of the lobule is necrotic. There is no infiltration with inflammatory cells.

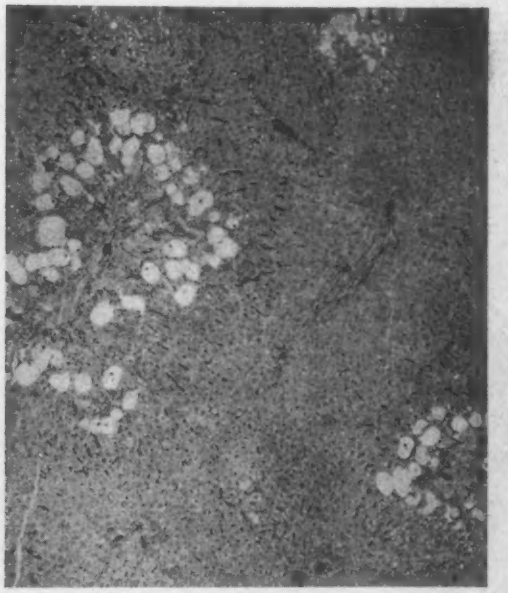

FIG. IV—Liver of rat 81 which had been administered 1·2 gm. of nucleic acid in two doses orally 48 hours prior to the injection of 0·25 c.c. of carbon tetrachloride per 100 gm. body weight. 25% of the lobule is necrotic. The necrotic area is infiltrated with a few histiocytes.

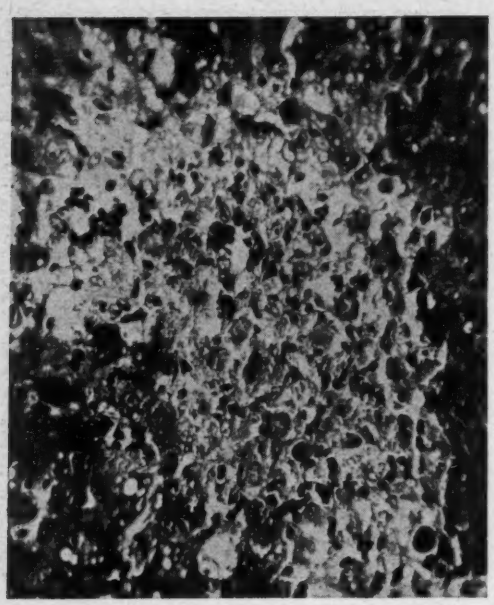

FIG. V—Liver of control rat 106 which had been injected with 0·2 c.c. of carbon tetrachloride per 100 gm. body weight. There is marked central necrosis without any apparent cell infiltration.

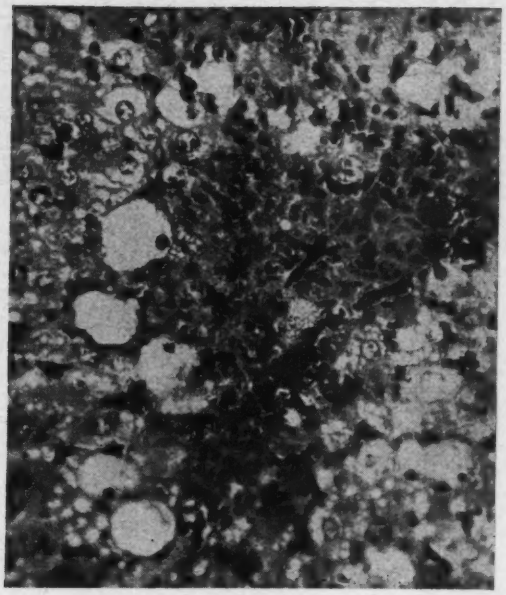

FIG. VI—Liver of rat 105 which had received 0·9 gm. of nucleic acid in two doses prior to the injection of 0·2 c.c. of carbon tetrachloride per 100 gm. body weight. There is a dense infiltration of histiocytes around the hepatic as well as the portal terminals.

SUNDARESON—*Protective Action of Nucleic Acid on the Liver in Carbon Tetrachloride Poisoning.*

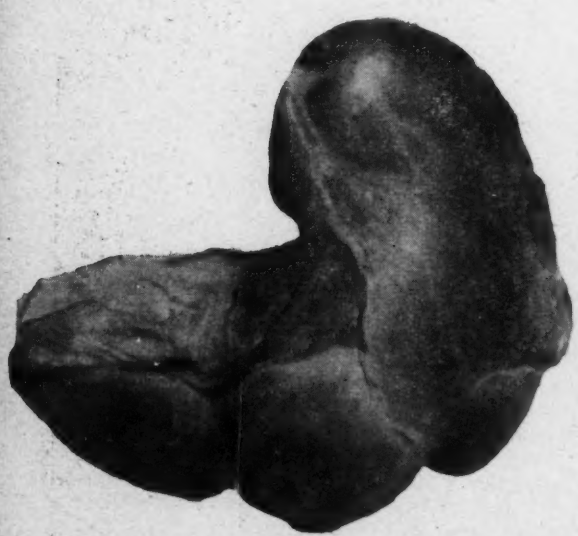

FIG. I—Photograph of superior surface of the anomalous liver.

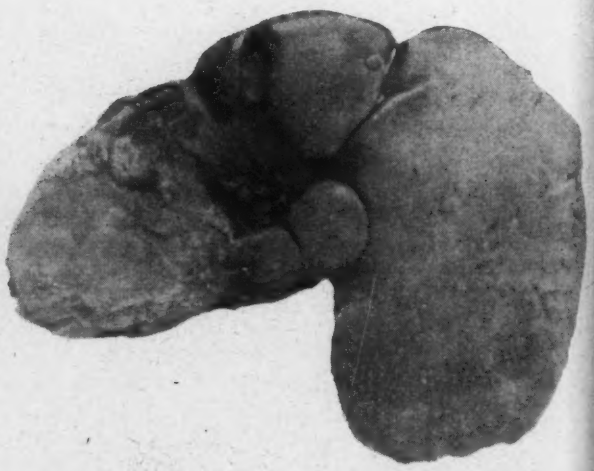

FIG. II—Photograph of inferior surface of the anomalous liver.

AYER & THANGAVELU—*Congenital Anomaly of the Liver*

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CONGENITAL ANOMALY OF THE LIVER

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An anomalous condition of the shape and lobulation of the liver was observed at a post mortem examination recently done by one of us. The subject was a man aged forty. The death was due to hæmorrhage from a chronic duodenal ulcer. There was apparently no causal relationship between the condition of the liver and the disease that caused the death of the subject. The anomaly of the liver appeared to be congenital. Pieces of liver tissue sectioned and microscopically examined showed no pathological changes. This confirmed the congenital nature of the abnormality.

MacMohan (1929) mentions that the more common gross anomalies of the liver are irregularities in the form and number or lobules, presence of cysts, presence of accessory liver nodules, and variations of the gall bladder and bile ducts. Gross anomalies of the liver are comparatively rare. But minor variations in lobulation are not infrequent. Such minor variations could be explained and understood on a developmental and evolutionary basis. In early human fœtal life and in certain lower animals also in the adult stage where the condition is primitive, the liver shows more lobulation than in the human adult. A reference to the literature on congenital anomalies of the liver, indicates that the specimen on hand shows certain unique features and is not similar to any previously published instance of liver anomaly. It is, therefore, considered necessary to report this case.

General Description of Specimen

The liver is of large size. It lacks the typical wedge shape and appears flattened like a thick pan cake. Its transverse measurement is 26 cm. and the maximum anteroposterior measurement is 22·5 cm. at the widest part of the left lobe. It weighs 1020 gms.

The striking feature is the preponderating size of the left lobe, and the very diminutive size of the right lobe.

The gall bladder was dissected out from its bed exposing a shallow fossa impressed at the site of a cleft between the right lobe and the quadrate lobe and grooving both the lobes.

The structures of the porta hepatis were cleaned and the usual relationships of the portal vein, bile ducts and hepatic artery were noticed.

Description of Individual Lobes

Left lobe—The left lobe is much larger than all the other lobes put together. It is elongated anteroposteriorly; the maximum anteroposterior measurement is 22·5 cm. and the maximum transverse width is 12 cm. At the anterior margin of the liver the separation between the left lobe and the quadrate lobe is effected by a deep notch cutting the liver to an extent of 3·5 cm. This notch is continuous on the inferior surface with the fossa lodging the ligamentum teres. On the upper surface the demarcation between the left lobe and the quadrate lobe is indicated by the attachment of the falciform ligament. The line of attachment of the falciform ligament is convex to the right and becomes continuous with the left triangular ligament. A small area (7 cm.×2·5 cm.) of the dorsal surface of the left lobe in close proximity to the œsophageal groove is posteromedial to the line of attachment of the left triangular ligament. On the superior surface of the left lobe are seen two linear indentations commencing at the anterior border. In the inferior surface are seen a fissure starting from the fossa for the ligamentum teres and passing transversely and also another crescentic indentation demarcating an oval area close to the lateral border. These extra sulci are indicative of the tendency for the sublobulation of the lobe.

A few small veins on the inferior surface of the left lobe are partly exposed on the surface being covered only by a thin film of liver tissue and capsule. This would lend evidence to an inference that the flattening of the lobe was congenital and not due to a spread of the soft viscus after removal from the cadaver prior to formalin hardening.

Quadrate lobe—The quadrate lobe is 15 cm. in anteroposterior extent and 8 cm. transversely. A small triangular portion of the posterior part of its superior surface is bare of peritoneum and occurs between the layers of the coronary ligament.

The quadrate lobe is united with the left lobe by liver substance along the depth of the fossa lodging the ligamentum teres. But it is completely separated from the right lobe by the fissue occurring at the site of the fossa for the gall bladder and it is also completely disconnected from the spigelian (caudate) lobe at the porta hepatis.

The anterior border of the quadrate lobe shows a secondary L-shaped fissure cutting into it in a transverse plane and demarcating a superior and inferior lobule near the right extremity of the anterior border. There is another fissure separating a clearly marked small lobule at the left extremity of the anterior margin of the quadrate lobe adjacent to the notch for the ligamentum teres.

Right lobe—The right lobe has an anteroposterior measurement of 10 cm. on its inferior surface. The posterior, superior and anterior surfaces of the right lobe, together form a convex dorsal surface. The upper layer of the coronary ligament passes from side

to side along the middle of the dorsal surface of the right lobe and the posterior part of the dorsal surface is bare of peritoneum. The right lobe is separated from the quadrate lobe by a complete fissure passing along the line of the fossa for the gall bladder. The right lobe is limited to the left on the posterior aspect, from the spigelian lobe, by the fossa lodging the inferior vena cava. But the right lobe and the spigelian lobe are blended into one mass of liver substance.

Along the anterior margin of the right lobe adjacent to the fossa for the gall bladder is a complex secondary fissure cutting into it obliquely and creating sublobulation.

Spigelian lobe—The spigelian (caudate) lobe is 6·5 cm. transversely, 4 cm. vertically and 3 cm. antero-posteriorly.

The inferior surface shows a well marked papillary process separated from a caudate process. The caudate process proceeds to the right and unites with the inferior surface of the right lobe.

The spigelian lobe is completely separated from the left lobe by the deeply cut fissure lodging the ligamentum venosum. It is also completely separated from the quadrate lobe by the porta hepatis. The spigelian lobe unites with the right lobe to form one fragment of the liver, which is distinct from the other fragment constituted by the blended left lobe and quadrate lobe. The only tissues that connect these two fragments of liver are the vessels and ducts and the fascial capsule.

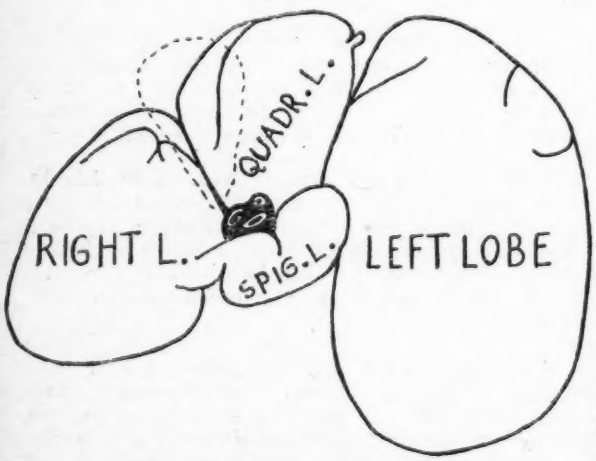

FIG. 3—DIAGRAM SHOWING FISSURATION AS SEEN FROM INFERIORLY. THE SITE OCCUPIED BY THE GALLBLADDER WHICH HAS BEEN DISSECTED OUT, IS INDICATED BY THE DOTTED OUTLINE

Ligaments of the Liver—The ligaments of the liver formed usually by the peritoneal folds, as well as the ligamentum teres and the ligamentum venosum are seen. Slight variations of the coronary and triangular ligaments, corresponding to the altered shape of the viscus, are noticed. The extent of the bare area in the specimen is smaller than usual as is to be expected, in consonance with the diminutive size of the right lobe.

MAIN FEATURES OF THE ABNORMALITY

When we analyse the descripion of the specimen, three noteworthy characters seem to form the basic feature of the anomaly.

(*i*) The large size of the left lobe relative to the right lobe.

(*ii*) The exaggerated lobulation.

(*iii*) The occurrence of a continuous cleavage line completely dividing the liver into separate fragments.

COMMENT AND DISCUSSION

The occurrence of alterations in the relative sizes of the right and left lobes of the liver has been noted by Rolleston (1893) and by Rolleston and McNee (1929). A case has been recorded of a liver with a very large left lobe, a large quadrate lobe, and a very small right lobe, with the gall bladder situated on the under surface of the right lobe quite close to the right lateral border. Rolleston's specimen partly resembles the specimen here described in the relative sizes of the chief lobes, but in sublobulation and fissuration, the two specimens are not alike. Rolleston also states that the lobulation of the liver might show the condition seen in transposition of the viscera, the right lobe being small and the left lobe large, the condition being a transposition of the lobes of the liver only without the full concomitant of situs transversus. There was no transposition of the viscera in the subject; and the liver does not appear to be a pure mirror image of a normal liver. It is manifestly something very different. Davy (1862) has described a case in which the left lobe of the liver was twice the size of the right. More details about his specimen are not available.

Keith (1899) regards increased lobulation of the liver as a primitive condition. He notes that the evolutionary fixation of the liver to the posterior abdominal wall occurring in anthropoids was evidently accompanied by the disappearance of the deep fissures of the liver. We may take the extent of the bare area of the liver as a reasonable criterion of the fixation to the posterior abdominal wall. In the specimen here described the extent of the bare area is relatively small. And the lobulation is more primitive in conformity with the small extent of fixation of the liver to the posterior wall of the abdomen.

Increased lobulation of the liver occurs in most of the lower animals including the monkeys among the lower primates and the gorilla among the anthropoid apes. According to Ruge (1902-1906), the generalized mammalian liver shows the left lateral lobe, left central lobe, right central lobe, right lateral

lobe, and the spigelian lobe with the processus caudatus and papillaris. Occasionally other minor lobules are also seen. Multilobulation is thus a primitive condition in the evolutionary scale.

During embryonic development also the fœtal liver is noticed to be more lobulated in earlier stages and becoming less lobulated in the older fœtuses. Further, there is a dominance in the size and development of the spigelian lobe and its caudate process in the earlier fœtus which gradually becomes normalized as the fœtus grows. Thomson (1899) gives the morphological correlationship of certain fœtal fissures occasionally persisting in the adult human liver. His diagram (Fig. 8, *J. Anat. & Physiol.* **33**:551, 1899) showing in one composite figure the arrangement of the fissures met with in the human fœtal liver is very instructive. Comparing the specimen on hand with Thomson's diagram of fœtal fissures, one notes that in this anomalous liver the following fissures are present which find representation in the fœtal condition.

(*a*) The fissures observed here on the anterior border and ventral aspect of the right lobe and quadrate lobe are survivals of fœtal fissures.

(*b*) The fissure detaching the small lobule on the quadrate lobe adjacent to the ligamentum teres is strikingly similar to the one bounding the small tongue-like lobule springing from the right lip of the umbilical fissure.

(*c*) The deep cleft at the site of the fossa for the gall bladder corresponds to the fissure which develops in the fœtal liver at the same site even prior to the appearance of the gall bladder vesicle. This fissure is not secondarily determined by the gall bladder, but is primary in nature. This fissure cuts through the liver substance completely and meets the porta hepatis. We could name it as the right lateral fissure. The fissure for the ligamentum venosum also cuts completely through the liver substance. Thus, the right lateral fissure, the porta hepatis, and the fissure for the ligamentum venosum form a continuous cleavage line dividing the liver into two separate fragments, one part consisting of the right and spigelian lobes, and other moiety consisting of the quadrate and left lobes.

For a similar condition neither the human fœtus nor the anthropoid apes would give us a parallel. Among the Old World monkeys, the Semnopithecus occupies a unique position showing some of the primitive characters of the Cercopithecidæ; and in it we see a condition very similar to the condition seen in the specimen here described. In *Semnopithecus entellus* (Ayer, 1942) the liver consists of two distinct and separate pieces or fragments of liver substance unbridged by any liver tissue. These two pieces are kept in close apposition and position only by the structures of the porta hepatis. One piece consists of the left lateral, left central and right central lobes, and the other piece consists of the fused right lateral and spigelian lobes. The anomalous human liver described here is in two pieces as in *Semnopithecus entellus*.

Summary

At a postmortem examination of a male subject, aged forty, a congenital anomalous condition of the liver was noticed. The left lobe was relatively very large and the right lobe was diminutive in size. There was extra lobulation of the left and quadrate lobes caused by fissures reminiscent of some of the fissures of the fœtal liver.

There was a complete division of the liver into two fragments by a continuous cleavage line representing the fissure at the site of the fossa for the gall bladder, running into the porta hepatis and further continuing into the fissure at the site of the ligamentum venosum. The right fragment included the blended right lobe and spigelian lobe; and the left fragment represented the fused left lobe and quadrate lobe. The significance of this condition is not clear. But it seems to be evolutionarily primitive. A condition homologous to this is seen in the liver of an Old World monkey, *Semnopithecus entellus,* in which also the liver is similarly and correspondingly divided into two fragments.

Acknowledgment

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SPECIAL ARTICLE

ROLE OF CHEMISTRY IN MEDICINE

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The contribution of organic chemistry towards the conquest of diseases and maintenance of health has been appreciated recently. Upto the nineteenth century the drugs used by the physicians for the cure of disease were extracted either from vegetable or animal substances. It has recently been appreciated by the doctors that chemical substances prepared in the laboratory are of the same nature clinically as those of natural prototypes like adrenalin, ephedrine and vitamins. These synthetic drugs may substitute natural drugs or in some cases may be more potent or superior to natural drugs as have been the cases with atebrin, plasmoquine, stilbœstrol, and sometimes, after laborious testing of pharmacological properties, they may be proved to be valuable remedies such as arsenicals, sulphonamides, barbiturates, vioforms and penicillin have turned out.

The first important synthetic compound introduced into medicine was acetyl salicylic acid or aspirin in 1899. The synthesis of aspirin and its use in medicine showed for the first time that a chemical compound prepared in the laboratory is effective in curing diseases. The discovery of aspirin is one of the greatest contributions of chemistry in medicine.

The direct suppression of infective agents by the administration of remedies which are the artificial products of chemistry was first conceived by Paul Ehrlich. It was Ehrlich who led a new quest for synthetic chemicals which may cure infections and the new science of 'chemotherapy' was created.

Diseases of Protozoa and Spirochaetes

It was natural for Ehrlich to direct his search first to the discovery of remedies against protozoal infections because there was the evidence that body did not protect itself against these infections by an effective reaction of immunity. Ehrlich first tried to cure malaria with methylene blue as early as 1891 but the real beginning of modern chemotherapy was made in trying to find out remedies against diseases due to trypanosomes. His first chemotherapeutic product—Trypan Red—a red dye—was found effective in mouse trypanosomiasis but without any effect on human infection. The discovery by Thomas and Breine in Liverpool of the activity of atoxyl in experimental trypanosomiasis in small animals led Ehrlich and his associates to prepare a new series of non-toxic arsenic compounds. 'Salvarsan' was the outcome of such series of extensive researches and it proved to be a remedy for syphilis, relapsing fever and other spirochætal diseases. Nature does not appear to have produced specifics for these diseases and discovery of Salvarsan has done much to the relief of man particularly from the scourge of syphilis. After the discovery of Ehrlich, many organic arsenicals were prepared but there has been little material advance beyond the initial compound produced by Ehrlich. Because of its unstable nature, arsphenamine has been replaced by neo-arsphenamine and sulpharsphenamine—all derivatives of Salvarsan. Of the pentavalent arsenic compounds, acetarsol has been used in medicine for the treatment of syphilis, yaws and amœbic dysentery. In contrast to arsphenamine, it exerts its action by mouth. Carbarsone, which is less toxic than acetarsol, has found its use in the treatment of amœbiasis and protozoal dysentery.

The value of emetine, cinophen, vioform has already been recognised in the treatment of amœbiasis. More recently Diodoquin has been reported as being effective in amœbiasis.

The use of penicillin in the treatment of syphilis is being explored and the preliminary observations justify the investigations into the use of the drug in all spirochetal diseases.

In 1906, Nicolle and Mesnil being dissatisfied with the results obtained with atoxyl, proposed the use of antimony compounds. Since then many antimonials were prepared and tried for the treatment of trypanosomiasis but none of them were found as effective as arsenicals. In course of time, the use of antimonials found a different sequence of development in therapy. In general, the antimonials are effective in treatment of leishmaniasis, schistosomiasis and granulomas.

Tartar emetic was introduced in 1915 for the treatment of kala-azar but it was found to be extremely toxic. The preparation of aromatic antimonials was made possible by the early work of Schmidt of the Chemische Fabrik Von Heyden, who in 1911, discovered the process of introducing antimony into aromatic nucleus. The first pentavalent organic antimonial employed in kala-azar was Stibenyl (Sodium 4- acetamino benzene stibonate). The drug failed to produce satisfactory results in Indian Kala-azar. Stibosan (sodium 3-chloro 4-acetamino benzene stibonate) offered a considerable improvement over Stibenyl. In 1922 Brahmachari introduced Urea-Stibamine which proved very effective. Neo-stibosan (diethyl ammonium p-stibanilate) is also now used extensively.

The amidines (Stibamidine, Propamidine) have received extensive clinical trials in treatment of kala-azar and the results so far obtained are satisfactory.

Bismuth compounds have extensive uses in medicine for the treatment of syphilis and yaws. Generally bismuth salts and complexes are more stable than arsenic and antimony.

Mercury compounds have long been used in medicine as spirocheticides. The parenteral use of mercury has long been popular in the treatment of syphilis but its toxicity has now discouraged its extensive use for this purpose. As diuretic, the action of mercurial—Mersalyl—is rapid and drastic too.

Antimalarials

Malaria is one of the most prevalent of human diseases. The treatment of malaria with pure quinine began as early as 1820. The first attempt to prepare synthetic antimalarial was made by Ehrlich—the father of chemotherapy. He showed that methylene blue

possessed antimalarial activity but much less marked than quinine itself. Although Ehrlich's attempt to prepare a better chemotherapeutic drug for malaria was abortive, the clues furnished by the structure of methylene blue led Schuleman and his co-workers to the discovery of Plasmochin. It is the most active though most toxic type of antimalarial yet discovered. Extension of this work led to the development of Atebrin by Metzsh and Mauss in 1930. Atebrin is more allied to quinine on its action as gametocide in benign tertian and quartan infections. It is rapidly absorbed and slowly excreted. As regards its toxicity, opinions differ but it has been observed during the war that a daily dose of 0·1 gram over periods of two years or longer did not produce any toxic symptom in the case of a large number of individuals.

During the war, a large number of compounds were prepared and examined as antimalarials, in U.S.A. Only a few of them have been found to be worthy of human test.

Chloroquine (SN 7618, Resochin, Aralen) which was first synthesised in Germany was studied extensively in America as antimalarial. Large scale trials have proved that it can terminate an attack of benign tertian more abruptly and cure malignant tertian malaria more promptly than atebrin.

Metachloridine (S.N. 11, 437) another synthetic antimalarial was extensively studied during the war. It is very active against several types of avian malaria but in human infection it is ineffective against malignant tertian infection.

Paludrine was synthesised by Rose and Curd at the Imperial Chemical Industries' Laboratory in England. It is a powerful schizonticide in benign and malignant tertian malaria, producing its effect in early schizont by preventing chromatin division and the formation of merozoites. It can be used as causal prophylaxis against malignant tertian malaria having lethal action against pre-ethrythrocytic forms. Against benign tertian infections, it acts as a partial causal prophylaxis. It, however, suppresses effectively all forms of malaria when given in a single dose once or twice weekly.

Malaria is the most serious disease in India. There are two ways by which the disease can be controlled. One is by extensive use of insecticides for destruction of mosquitoes and by use of suitable repellants which may prevent the mosquitoes from biting a human being. And the second mean is the use of effective drug for protecting man against infection.

The Malaria Institute of India is the central organisation for advising the Government on all matters relating to malaria. It is difficult to appreciate the services rendered by the institution for the prevention of malaria in India. In contrast, in America, a large number of synthetic compounds have been prepared and studied for their antimalarial and insecticidal properties. It will not be out of place to mention, here, the discovery of DDT—a very cheap insecticide for controlling malaria mosquitoes and the new insect repellant dimethyl pthalate which is found to be a very effective repellant against malaria mosquitoes.

The researches done in Indian laboratories on antimalarials have only academic value. When we compare the advances made in U.S.A. and in England, in the field of synthetic antimalarials, the work and schemes of eminent scientists in India seem to be absolutely insignificant. Researches on antimalarials which may lead to the discovery of true prophylaxis may be encouraged but at present we must concentrate more on the large scale production of known and established antimalarials and insecticides.

Sulphonamides

The story told above is sufficient to show the success of chemistry in producing efficient specific remedies for infection with protozoa and spirochætes. For many years, synthetic chemistry had a conspicuous lack of success in discovering analogous artificial remedies for bacterial infections which are more familiar to us. In 1935, the announcement of the anti-bacterial properties of 'Prontosil' by Domagk brought a sensation in the medical world. The subsequent rapid development of sulphonamide drugs completely revolutionised the treatment of human bacterial diseases. This development was due to the discovery by Trefouel, Bovet and Nitti of Pasteur Institute in France that the m-phenylene diamine portion of the Prontosil molecule played no part in its activity as an antibacterial agent and sulphonamide itself was equally, if not more, active than Prontosil. This discovery stimulates various workers in different countries to prepare sulphonamide compounds with the object of discovering better and more powerful types of drugs which may cover a wider range of infection. During the last ten years, thousands of sulphonamide compounds were prepared but the majority of these were found to possess no increased activity *in vivo*. At present sulphapyridine, sulphathiazole, sulphadiazine, sulphamerazine, sulphamethazine, sulphacetamide, sulphaguanidine, succinyl sulphathiazole, pthalylsulphathiazole, are the most therapeutically important sulpha drugs.

Sulphanilamide and other sulphonamide drugs have caused a considerable drop in the mortality rate of puerperal fever. Surprisingly good results have been obtained in general septicæmia. The treatment of erysipelas has also been remarkably successful with sulpha drugs. Sulpha drugs are active against meningococci, pneumococci and gonococci. Cases of gas gangrene have recovered with dramatic rapidity with the administration of sulpha-drugs.

Of the sulpha drugs, sulphadiazine is rated as the drug of choice because of its high potency and low toxicity. Sulphamerazine was introduced with the claim that in half the dosage, it produced an equal blood level of drug and equivalent therapeutic response but it is more toxic than sulphadiazine. Sulphamethazine causes less danger of kidney stoppage because of its higher solubility—but greater doses are necessary and in the opinion of many clinicians, the drug is not as valuable as sulphadiazine. Sulphacetamide (Albucid) forms a highly soluble and neutral sodium salt which is employed in eye infections. It is used in urinary tract infections and its high solu-

bility eliminates danger of crystallisation. It is used with success in the treatment of gonorrhœa.

Sulphaguanidine has been of immense importance in combating dysentery because of its poor absorption and rapid excretion. It can maintain a higher concentration in the gut without danger of toxicity associated with high blood levels. Sulphasuxidine and sulphathalydine are also important drugs in the treatment of intestinal infections.

Recent medical opinion places sulphadiazine as the drug of choice in dysentery because of its higher potency. Its high concentration in blood is now considered as an advantage in the treatment of severe dysentery.

Nausea, dizziness and depression occur frequently with the intake of sulpha drugs but this inconvenience is insignificant when we consider the benefit obtained by the drug. Agranulocytosis and anæmia occur sometimes but in most cases, the treatment has been continued longer than usual.

Oral administration of sulpha drugs serves almost all purposes. A high initial dose is followed by further doses at regular intervals to maintain the necessary concentration of sulphanilamides in the blood. Unless a high initial dose (about 2 grams) is given, the concentration of the drug in the blood serum may be insufficient to effect complete bacteriostasis and administration of sub-effective doses tend to encourage the formation of sulphonamide-resistant strains of bacteria which cannot be controlled even by increasing the dose.

Sulphonamides are used in powder form in the local treatment of wounds and burns as well as for prophylaxis in surgical operation.

The action of sulphonamides is bacteriostatic and not bactericidal. The therapeutic agent does not itself kill the bacteria but it prevents the multiplication until eventually, the natural defence of the body overcome them. The present view about the mode of action of sulphonamide is that it prevents bacteria from utilising p. amino benzoic acid which is essential to their growth. The action is one of the interferences in the nutrition of bacteria.

Antibiotics

A revolution in the chemotherapy of bacterial infection was caused by the discovery of Penicillin by Fleming in 1929 and the discovery of its chemotherapeutic properties by Florey and others. The story of isolation of Penicillin free from harmful concomitants from a strain of Penicillin notatum and its large scale manufacture is one of the most romantic scientific achievements of chemistry working in close co-operation of medical biology.

Penicillin is extremely active against gram positive organisms including streptococci, staphylococci, pneumococci, clostridia, gonococci, meningococci. It is not active against B. coli, B. typhosus, B. dysenteriæ, ps. pyocyanea. Unlike sulphonamides, its action is not inhibited by blood serum, pus and p-aminobenzoic acid. Its toxicity is extremely low and secondary effects are absent. It is excreted rapidly and hence frequent doses are necessary. It is administered to the infected part or by intravenous or intramuscular injection. It cannot be taken orally because its activity is largely destroyed by the acid of the stomach. It is useful in sulphonamide-resistant cases. The action of penicillin was known to be bacteriostatic but recently it is believed that it has the bactericidal and lytic property.

Streptomycin—an antibiotic—extracted from the specimen of a soil-microbe—Actinomyces grisens—draws the attraction of the clinician as it possesses the necessary properties to be effective against gram negative pathogens. *In vivo,* streptomycin cures experimental animals infected with species of Salmonella, Pseudomonas, Shigella, Brucella, Klebsiella, and Myobacteria. It has been used with considerable success in the tuberculosis of guinea pigs.

Various other antibiotics were discovered since the announcement of the discovery of Penicillin but none of them have been proved superior to Penicillin.

Antiseptics

Under the heading a very large group of substances possessing the power of being able to kill or to prevent the growth of pathogenic organisms are involved.

The use of iodine and phenols for general disinfectant purposes is well known. It has been found that chloro-derivatives of cresol and xylenol are more active than parent phenols.

Copper salts are not widely used as bactericides although they are employed extensively as fungicides and algicides.

Silver nitrate is corrosive and irritating and hence its use is limited.

Mercury salts are highly toxic to man and animals and their uses are also limited.

During the past several years, a great many organic mercurials such as mercurochrome, metaphen, merthiolate, phenyl mercuric nitrate etc. have been found to possess germicidal actions both in septicæmia and localised bacterial lesions. They are less irritating and less toxic than many other bactericides.

The need for search of antiseptics which are non-irritant and active in presence of serum became acute during the First World War. This search led to the discovery of Acriflavine and Proflavine—which are the derivatives of amino acridines. Work in this direction is still in progress to find out a suitable amino-acridine compound as ideal bactericide.

Merfanil-p (Aminoethyl) benzene sulphonamide has been receiving a greater amount of interest because of its antibacterial activity in presence of pus.

Local Anaesthetics, Hypnotics and Sedatives

Cocaine is a powerful local anæsthetic. It has the drawback that people are addicted to it easily because

of its power of relieving exhaustion and repelling gloom by producing a delightful sense of mental and physical vigour. Chemists, in attempting to synthesise compounds similar in structure to cocaine as local anæsthetics, prepared a large number of compounds, such as amylocaine, benzocaine, procaine etc. Of these procaine hydrochloric is extensively used as a powerful local anæsthetic. As its effect is very transient it is usually mixed up with adrenaline in order to have more prolonged effect. It is much less toxic than cocaine and is well tolerated by the tissue.

The principle of production of sleep through the administration of drugs was known many centuries ago when the physiological action of ethyl alcohol and opium became known. From the time of discovery of the action of chloral till 1903, when Fischer and von Mering introduced barbital, three other useful hypnotics namely paraldehyde, urethane and sulfonal were discovered. It is interesting to note that these compounds have little in common so far as their chemical structures are concerned.

Barbituric acid derivatives have found a wide use as hypnotics because of many advantages possessed by them. Hypnotic doses of barbiturates seldom cause serious secondary reactions, although a period of pre-excitement even to delirium may, sometimes, be experienced.

The newest advance in barbiturate therapy consists in the intravenous administration of thiobarbiturates —Pentothal and Thioethymal—in producing general anæsthesia. When administered according to rigidly prescribed technique, thiobarbiturates, which are generally toxic, produce an intense anæsthetic reaction of short duration without any untoward effect. Amytal and Nembutal have also been used for producing basal anæsthesia.

Dilantin (5—5′ diphenyl hydantoin) has been found to be a valuable agent in the treatment of epilepsy. It is useful in grand mal type of seizure where bromides and phenobarbital are completely useless.

Recently Tridione (3, 5, 5 trimethyl oxazolidine 2-4 dione) is found to be more effective than Dilantin or Luminal in controlling the convulsions induced in experimental animals.

Chemotherapy of Tuberculosis

Various drugs prepared before the advent of sulpha drugs were proved incapable of producing a convincing curative or deterrent effect on an experimental tubercular infection. Recently sulfone group of compounds such as Promin (pp′ diamine diphenyl sulfone NN′ didextrose sulfonate) Diasone (Di sodium formaldehyde sulphoxylate diamino diphenyl sulphone), Promizole etc. have been found to possess a considerable favourable influence on the experimental tuberculosis in guineapigs.

The clinical results obtained in the treatment of tubercular patients with sulfone drugs are encouraging no doubt but not comparable with the striking results obtained in guineapigs. The failure to obtain prompt results in human patients may be due to the fact that human beings cannot tolerate sulfone drugs in doses comparable on the basis of body weight to those administered to guineapigs. Further work is in progress.

It has been observed that streptomycin exerts a striking suppressive effect in experimental tubercular animals. Streptomycin has the great virtue that it is practically non-toxic.

Vitamins

The investigations of nutrition that have been initiated since the second decade of the present century have afforded an entirely new outlook upon many disorders some of which have long been suspected to be of dietary origin. The absence of vitamins from a diet which is satisfactory in other respects leads to the development of a typical syndrome which is called "a deficiency disease" such as xerophthalmia, beriberi, scurvy, pellagra, ricket etc. Vitamins are present in foods specially in fresh vegetables and fruits, milk etc. Vitamins are susceptible to destruction due to heat and air. The problem of supplying adequate vitamins to patients suffering from deficiency diseases was extremely acute before the discovery of synthetic vitamins. More than twenty naturally occurring compounds having vitamin activity have been isolated and identified. They are now available in synthetic forms having the same physiological properties as the naturally occurring compounds.

It is now established through the brilliant researches of Karrer that alpha, beta, gamma carotene and cryptoxanthin are the precursors of vitamin A and all these are produced in the plant kingdom. Ingestion of these substances by animals results in the formation of vitamin A in the body.

Vitamin B complex is considered to consist of six compounds—thiamine, riboflavine, nicotinic acid, pyridoxine (B_6), pantothenic acid and Vitamin B or folic acid. All these vitamins have been synthesised and available at very cheap price.

The synthesis of vitamin B_1 or thiamine was possible by the effort of R. R. Williams who noticed in 1939 that thiamine breaks down into two simpler compounds by the treatment of sodium sulphite in weak acid solution. Williams actually synthesised vitamin B_1 in 1939. The various stages in the synthesis of thiamine have been so very perfected that now the vitamin is available at a very cheap rate—about Re. 1/- per gram.

The steps for the synthesis of riboflavine were worked out during 1934 by two groups of chemists—one headed by Karrer and the other headed by Kuhn.

Nicotinic acid and its amide are produced synthetically in such a huge quantity that its price fell down

from Rs. 150/- per pound in 1939 to Rs. 20/- per pound.

The synthesis of Pyridoxine—the rat dermatitis factor—was made possible mainly through the effort of Kuhn. Pyridoxine is prepared now on large scale and the price dropped from Rs. 50/- per gram in 1939 to Rs. 10/- per gram.

Pantothenic acid was recognised by R. J. Williams and his co-workers as a factor capable of promoting growth of bacteria and yeast. The price has been reduced from Rs. 10/- per gram to Rs. 2/-.

Vitamin C or ascorbic acid is the first synthetic vitamin to be introduced commercially. The price of natural vitamin C was Rs. 800/- per ounce and the price of synthetic vitamin C is Rs. 6/- per ounce.

The chemical nature of vitamin E was discovered by Evan, Emerson and Emerson. In 1938, Karrer first synthesised tocopherol. Recently the technique of preparing pure synthetic tocopherol has been improved.

Vitamin K was discovered and named by Dam of Copenhagen in 1935 when he observed in newly-hatched chicks a fatal hæmorrhagic diathesis which could be cured or prevented by the administration of a non-saponifiable non-sterol fraction of hog liver or alfalfa. Investigations have shown that there are at least two naturally occurring substances having naphtoquinone nucleus which have similar physiological properties and they are referred to as vitamin K_1 and K_2. Recently a number of naphtoquinone derivatives have been prepared which produce a wide range of vitamin K activity.

The term vitamin D is applied to two or more substances which help in the proper utilisation of calcium and phosphorus. Two forms of naturally occurring vitamin D have been isolated. One of these Vitamin D_2—or Calciferol is obtained in pure crystalline form as one of the products of the ultraviolet radiation of ergosterol.

Endocrinology

Rapid advances have been made in the past decade in the chemistry of hormones. Today, we know not only the chemical constitution of adrenalin and thyroxin which have been synthesised but also the constitution of many other hormones. In some cases, the synthesis of actual hormone has been achieved.

According to the present day knowledge, the anterior lobe of the pituitary is probably the major determining factor in endocrinology of the whole human system. The gland is known to control and regulate the functions of other glands including gonads, suprarenal cortext and thyroid. These different factors of anterior lobe of pituitary could not be isolated in pure form but the extracts containing some of them are available commercially.

There are three natural steroid hormones of major importance, namely testoterone (male or androgenic hormones) œstradiol (female or dehydrofollicular hormones) and progesterone—the hormone of corpus luteum.

The effect of castration has long been known. Butenandt isolated both andosterone and dehydroandosterone from human urine but subsequently Koch and Gallagher isolated from bull testes a product which is five to ten times more active than andosterone and from this Laqueur and his associates obtained in a pure state—testosterone—which is now regarded as true male hormone. The quantity of testosterone obtained from one ton of bull testes varies from 90 mg. to 270 mg. and the mode of obtaining hormone by this way is absolutely useless for practical purpose. Testosterone is now prepared synthetically from cholesterol. The synthetic testosterone is used in clinical practice for replacement therapy and rectification of abnormal condition.

As with male hormones, progress in the chemistry of follicular hormones, œstrone and its reduction product Oestradiol was extremely difficult. Active œstrogenic extracts were obtained from the ovaries by Allen and Doisy in 1924. But it is after Zondek's demonstration in 1930 that urine of pregnant mare contains much larger quantities of the active material, that substantial progress was possible. Oestrone was isolated in crystalline form independently by Doisy and Butenandt in 1929 and its structure was subsequently determined. Oestrone is obtained from natural sources—usually from the urine of pregnant mares, although 'stallions' urine provide a richer source. The presence of œstrone a female hormone in the urine of stallion is remarkable and it shows that the terms 'male' and 'female' as applied in the field of hormones are to a certain extent arbitrary.

The main clinical uses of Oestrone and Oestradiol are in replacement therapy either alone or in association with the hormone of corpus luteum. It may be mentioned here that artificial œstrogenic agents Stilbœstrol, Hexœstrol and Diencestrol are able to produce in a remarkable manner all the complex physiological responses associated with the natural œstrogens and in addition they have the advantage of being active by mouth.

Progesterone—a hormone of corpus luteum—was isolated in pure crystalline form and its constitution was established. Butenandt and Fernholz actually synthesised it from stigmastrol. Attempts are being made for synthesising Progesterone from the more easily available sterol-cholestrol. Progesterone is used in clinical practice in the form of an oily solution for intramuscular injection. It is used in cases of habitual abortion and it has been claimed that the causes of sterility in females in many cases are due to the deficiency of this hormone.

The above examples will illustrate some of the contributions made by chemistry to the science and practice of medicine. The examples cover only a part of the vast field and these will indicate the extent to which progress of medicine is dependent on chemistry.

CASE NOTE

ENCAPSULED DEAD FOETUS IN THE PERITONEUM

R. N. RAJU, M.B.B.S.,
AND
P. RAMA RAO, M.B.B.S.,
Osler Hospital, Podur, West Godavari Dt.

T.R., H.F. 35 yrs., came with fever and a large mass (abscess) occupying the left iliac fossa and hypogastrium. The abscess pointed at the pouch of Douglas. She could not give a definite history; the large abscess dominated the picture and an incision was advised. She did not agree to operation. Three months later she saw us again. This time the mass (abscess) receded and settled down to a very hard and irregular lump firmly fixed in the left iliac fossa and hypogastrium. It was tender. A course of pyrexia therapy and sulphanilamide was given and she was advised to see us every fortnight. The size of the mass was unaltered and its shape and character were just the same. It was as hard as bone and extended nearly to the crest of the ilium. A provisional diagnosis of tubo-ovarian mass was made; but the hardness of the mass as bone could not be understood. It did not seem to be a neoplasm, because it was not enlarging and the fact that she came with an abscess, soft and pointing at the posterior fornix six months back, excluded such a possibility. Under spinal analgesia, exploration was done by a left paramedian subumbilical incision. Peritoneum was opened and a very hard irregular mass in the left iliac fossa was noticed having adhesions all round with the descending colon, small intestines, greater omentum and broad ligament. It was found to contain fœtal bones and a diagnosis of secondary abdominal pregnancy with an encapsuled dead fœtus was made. It was obviously impossible to excise the whole mass. So the wall was incised, after carefully packing the general peritoneal cavity. There was some thick foul smelling pus which was swabbed off. All the skeletal parts of a fœtus of 24 weeks' age were removed. The abscess cavity was marsupialised to the lower part of the wound, the peritoneum was sutured, and the wound was closed in layers. The abscess cavity was being dressed with acriflavine gauze from the fourth day after operation. The patient made an uneventful recovery and the wound healed up in seven weeks.

On very careful enquiry and with some amount of leading questioning, she gave a history suggesting a tubal rupture with a feeling on her part of a mass growing and balloting subsequently in the lower abdomen. 24 weeks after the onset of amenorrhoea, it appears she had acute pain and distress in the lower abdomen and the mass ceased to move ever since. Subsequently she had fever and pain in the lower abdomen for which she saw us on the first occasion.

(Continued from page 300, Col. 2)

preached with good effect. It is easier to teach and convince at a tender age. "Health education must promote health and health consciousness and these are best achieved when health practices become a part of an individual's daily life".

A school health organisation can function best when there are understanding and co-ordination of action among those participating in it. They should realise that they are aiming at a common purpose and the good result which will be achieved by joint efforts will redound to the credit of all taking part. The first thing to claim their attention should be nutrition. In the midst of under-nutrition and mal-nutrition for which not only economic reasons but traditional customs and habits peculiar to every province are responsible, balanced diets have to be evolved having regard to popular prejudices. The co-operation of Nutrition Research Centres will be of value. Adequate health protection should be afforded to the children "based on periodical examinations, correction of defects, preventive work including prophylactic inoculations where necessary and follow-up in the homes of the pupils." Due importance should be given to physical education by *jiujitsu*, gymnastic exercises in suitable cases, outdoor games calling for team work and other corporate recreational activities. Health education should be given to enable the child to learn and practise personal hygiene. This should be supplemented by elementary knowledge of biology. Maintenance of a high standard of environmental hygiene is essential. Broadly speaking, town and village planning, housing, water supply and general sanitation come under this. It is obvious that modern engineering including sanitary engineering have to play an important role and their unstinted services are indispensable. The great undertaking of "Better Health" campaign can be successful only if there is a close co-ordination among the school master, doctor and engineer.

In every school the teaching of hygiene should begin at the earliest stage. This should not only be theoretical but practical, so that the foundation of health habits and knowledge of personal hygiene can be well and truly laid. It is particularly important that the student should see, in actual operation, the sort of hygienic and sanitary arrangements he is taught and encouraged to demand for himself. It is far more important to convince those responsible for the uplift of our fellow countrymen that a free land cannot remain free for long unless the inhabitants are strong and healthy.

JOURNAL OF THE

INDIAN MEDICAL ASSOCIATION

CALCUTTA, JUNE, 1948

NEED OF A PLANNED TRAINING OUTSIDE INDIA

Elsewhere in this issue we are publishing a letter from a correspondent who has recently been abroad as a state scholar on a medical subject. The writer of the letter raises several very important points which deserve close consideration by the authorities concerned for the success of the scheme of improving medical aid and education of the country. Firstly, the lack of proper planning in fixing up the programme of training of the scholars is deplorable. It appears that the authorities concerned in arranging the programmes are not well informed as regards the training facilities offered in different hospitals or institutions in Europe, England or U.S.A., specially those which do not run any regular advertised courses.

Secondly, when a programme is drawn up for a particular scholar, little attention is paid for his exact individual requirements. As far as we know, the scholars selected, at least in Bengal, are not raw graduates just out of college, but are persons who have fairly good hospital or teaching experience or both in their special branches. It is desirable therefore that they should be allowed more freedom of choice as to the institutions or hospitals which they want to attend. Placing them into water-tight rigid programmes without regard to their particular requirements, greatly handicaps them and frustrates the very purpose for which they were selected. Besides, the little pin-pricks of official red-tapism and formalities are often a source of constant irritation and disgust. Permission has to be sought for every movement of the scholars but the letters for such permission are often left unanswered for considerable time causing serious inconvenience. Individual efforts by the scholars to secure good training facilities are often frustrated by the formalities of taking sanction of this or that committee or of the home Government in India, or of provincial Government and consequent delay.

The writer has also rightly remarked that no specialist can work without a supporting team of skilled workers; therefore in awarding scholarships Government should select a team of workers who will work in co-operation with each other. In order to avoid their being placed in different hospitals at the completion of their training we would suggest that the Government should select a team from one particular institution, so that they form a compact unit of trained workers. These teams may be selected from different institutions by rotation every year, so that eventually each institution will have such trained teams of specialists.

We would further suggest that foreign specialists in different branches may be invited to work in different Indian Institutions with a complete team of their own on a contract basis and thus train our young graduates. This may ultimately be cheaper and a better way of giving higher training to our specialists instead of sending them abroad in large numbers.

It is also necessary that the senior members of the profession holding professorial or other higher posts in different hospitals, should be encouraged to go abroad at intervals to keep in touch with current developments in their special subjects. Special conditions in keeping with the status and responsibilities of the senior staff, such as increased allowances, family allowances during their absence, etc., should however, be allowed, as is done for the fellowships of the Wattumull Foundation.

In concluding, we would like to draw the attention of the health directorates both of the central and provincial Governments to these suggestions.

HEALTH EDUCATION

The low level of health in India has not received proper attention. It has been attributed to the want of provision of environmental hygiene, want of adequate and balanced nutrition, non-availability of proper health protection, preventive and curative, to the rich and poor alike, and absence of co-operation of the people in the maintenance of their own health through poverty, ignorance and indifference. To bring about prosperity, enlightenment and happiness, health education is necessary. This has been made possible now that the Government is free to enforce compulsory education on children. It is in the schools, both in urban and rural areas, that the gospel of better health can be

(Concluded on page 299)

CURRENT TOPICS

I

MEDICAL EDUCATION ABROAD

Medical Education in England

The following is the summary of two broadcasts from London by Prof. R. U. Hingorani made following the receipt by him of over 900 letters from Indian students, mostly medical, asking for information. The summary is presented in question and answer form.

Question—What is the present position of medical training in England? Are Medical Colleges accepting overseas students?

Answer—Yes, although in common with all other Colleges, they can only accept a small percentage of the applications that reach them. Most Indian medical students seem to prefer the University of London, due probably to their feeling that a London Degree confers a certain social distinction on a Doctor, but medical education in Great Britain is standardised and Degrees and Diplomas are granted by many other Universities. In England for instance, training is given by the Universities of Birmingham, Bristol, Cambridge, Durham, Leeds, Liverpool, Manchester, Oxford, and Sheffield, in addition to London. In Wales—Cardiff University and in Scotland—Aberdeen, Edinburgh, Glasgow and St. Andrews Universities all have Medical Colleges. Students should be prepared to accept admission wherever it can be granted as they will be assured of receiving precisely the same training. For instance, the Post-Graduate Hospital in Hammersmith and the Childrens' Hospital in Great Ormond Street in London have undoubtedly a world-wide reputation, but they are by no means the only Hospitals in their particular spheres. In London alone there are 12 Childrens' Hospitals and very many Medical Schools offer Post-Graduate Diplomas.

Question—Should applications for admission be sent direct to Universities or Medical Colleges?

Answer—No. All applications should be submitted to the High Commissioner in London. Students should by all means state their indivdual preferences but they should also state that they are willing to accept admission in any Medical School in Great Britain, if necessary. Most Colleges have a quota for overseas medical students and welcome them whenever they can. They have no prejudices of any kind but they have of course to give priority to their own old students returning from the Services.

Question—What is the length of training required for the various medical Degrees and Diplomas?

Answer—Complete medical training extends over a minimum period of six years. Post-Graduate Diplomas such as D.O.M.S., D.L.O., etc. require about 12 to 18 months' study, but Indian Doctors who wish to take a Fellowship or Membership Examination, should be prepared to stay in England at least two years.

Question—What examinations does a student take at the end of the full six years' training?

Answer—He can either read for the conjoint Diploma, L.R.C.P., M.R.C.S., or the Degrees, M.B., B.S., the latter qualification being considered the higher. An Indian student who wishes to qualify in England, should pass in India, either the London Matriculation or the Intermediate B.Sc. Examination of a recognised Indian University (Bombay, Calcutta, Lucknow, Madras, Patna or Punjab (Lahore)) so that he may claim exemption from the Preliminary Examination to be taken before entering a Medical College.

Question—Can a fully-qualified Doctor read for two Diplomas or one Diploma and a Degree at the same time?

Answer—Yes, that is possible but he may find a few difficulties in his way. If he wishes to take, for instance, D.O.M.S. and D.L.O. together, he will first of all have to discover a Medical College where training is given for both these Diplomas and then endeavour to secure admission for each course.

Question—Is it possible for an Indian Doctor to obtain a part-time appointment during the period of his stay in England?

Answer—Yes, if his qualifications are registrable with the General Medical Council. In practice, however, very few appointments of this kind are available as they are usually reserved for disabled ex-Service men.

Question—Can a Doctor holding the Indian Degrees M.B., B.S., qualify as M.D. or M.S. of a University in Great Britain?

Answer—Universities in Great Britain only admit their own graduates to their M.D. or M.S. Examinations.

Question—What is the cost of medical training in England?

Answer—Unlike the training, each University has its own scale of fees but details can be obtained from the Dean of any Medical College together with particulars of the various courses.

Post-Graduate Medical Education Abroad

Note by Dr. S. C. Sen, Honorary General Secretory, Indian Medical Association for 1946-47, on 'Facilities for Post-Graduate Medical Education abroad':

During the session of the World Medical Association in Paris last September (and subsequently in London) where representatives of 41 National Medical Associations were present, I discussed with various representatives—particularly those mentioned in the enclosed list—the possibilities of placing Indian Medical Graduates for post-graduate training in specialised subjects like, Neurosurgery, Orthopœdic, Chest and General Surgery, Medicine, Neurology, Cardiology, Psychiatry, Radiology, Hydro-therapy and Health administration, etc. and most of the continental representatives present were willing to offer every possible facility to our students. Prof. Dr. Jaroslav Stuchilic of Prague (who is the President elect of the World

Medical Association) thought it might even be possible to accept postgraduates in various Departments and arrange for house appointments which will mean free tuition, board, and lodging. The continental doctors felt that it might be better if the Ministry of Health of the Government of India were to communicate direct to them, mentioning the number of postgraduates they wanted to send and the particulars of the various courses to be studied. On receipt of such communications, our friends will either approach the various faculties of the Universities in their respective areas or the Governments concerned and try to arrange matters to suit the requirements of India.

Regarding U.K. Canada and U.S.A., the position, just at present is somewhat difficult, owing to the large influx of demobilised medical men seeking postgraduate education. The situation, however, is expected to be easier in course of the next year or two. In any case, our friends in U.S.A., Canada and England are willing to render all possible help in the matter. Dr. Charles Hill, Secretary of the British Medical Association informed me that the British Medical Association in shortly organising a new department specially to look after and arrange for the social and professional requirements of the Dominion postgraduates in the U.K. During my short stay in London, I had the opportunity of discussing this matter with Mr. Menon, the High Commissioner and he was of the opinion that it would be advisable to utilise the facilities available on the continent to the utmost. The difficulty of language could be overcome by giving a few months intensive training in language to selected candidates either in India before their departure or in London or in the Continent.

I would like to suggest the following procedure in this connection.

(1) That a tentative list of subjects for specialisation and the number of post-graduates to be sent for each branch be first decided upon.

(2) As soon as this has been done, letters be written to the various Doctors as per list attached making enquiries on all relevent subjects, for example facilities available, expenses, time required etc. This may be done preferably by the Ministry of Health, or if it is so desired, I can start the correspondence either on behalf of the Government or the Indian Medical Association.

(3) After this has been done, suitable candidates be selected for particular studies. It is desirable that only post-graduates of some standing and experience, in each subject be sent so that they may get the maximum benefit from their studies abroad.

(1) Dr. Louis Hopewell Baur, M.D., Professional Building, Hompstead. N.Y. (U.S.A.).

(2) Dr. Thomas Clarence Routley, C.B.E., M.D., L.L.D., F.R.O.P. (C), General Secretary, Canadian Medical Association, 135, St. Clair Avenue, West, Toronto (Canada).

(3) Dr. G. D. N. Cameron, M.D., D.P.H., Deputy Minister of National Health, Ottawa (Canada).

(4) Dr. Charles Hill, Secretary, British Medical Association, B.M.A. House, Tavistock Square, London W.C. 1.

(5) Dr. Dag Knutson, Skandiavaogen 16, Djursholm, Sweden.

(6) Dr. Forgen H. Berner, Laege Generalsekretoer, (General Secretary of the Norweigian Medical Association) Gyldenloves gt. 29. Oslo (Norway).

(7) Prof. Dott Giusto Fegiz, Medico Primario Nell'istituto, Carlo Forlalini, Roma (Italy).

(8) Dr. Alexander Hartwich, President der Wiener Arztekammar, Wickenburggasse 19. Vienna VIII (Austria).

(9) Prof. Dr. Jaroslav Stuchlik (President Elect of the W.M.A.), Professor of Psychiatry, Charles University, Prague, Head of the Department for International Relations, Ministry of Health, Chairman of the Czechoslovak Medical Association, Prague XII, Legerova 8., Czechoslovakia.

(10) Dr. Otto Leuch, Treasurer, World Medical Association, Stockerstir 27., Zurich 2., Switzerland.

(11) Docteur V. A. Fenger, Medicine de la cour, de Sa Majeste' se Roide Danemark, Copenhague.

(12) Dr. Aleksej Zahor, Ophthalmologist, Principal Medical Officer of the Workers Accident Insurance for Bohemia, Na Porici 39., Prague II., Czechoslovakia.

Empire Medical Advisory Bureau

The following letter from Mr. H. A. Sandiford, M.C., M.B., CH.B., D.P.H., Medical Director, Empire Medical Advisory Bureau, to the Editor, *J. Indian M. A.* will be of interest to the members of the I.M.A.:

The Council of the British Medical Association approved the scheme of organisation of the above Bureau on 29th October, 1947, and have appointed a Committee of Management to organise and develop the Bureau and allotted funds for this purpose.

The object of this letter is to inform medical men and women who intend visiting the United Kingdom of the aims of the Bureau, which is housed at B.M.A. headquarters, and the services which it can provide.

One of the main objects of the Bureau is to welcome our overseas visitors from the Dominions and Colonies and make them feel at home in this country.

It is hoped to arrange for them to be met on arrival by a fellow-medical at the ports, though this may not always be possible and in any case the visitor

is cordially invited to contact the Bureau as soon as possible after arrival in this country and talk over with me any points on which he may need advice or assistance. The Bureau aims at a personal advisory service, which is freely at our visitors' disposal.

The main object of most visitors will be to enlarge their professional knowledge, and detailed information on postgraduate educational facilities and on the courses of study necessary for higher qualifications will be available and, where required, the necessary contacts and introductions will be provided. Visitors who wish to see something of the latest medical and surgical techniques can be put in touch with the appropriate practitioners in these and it is hoped that information on researches being carried out will also be available in due course.

The problem of finding somewhere to live is acute but every endeavour will be made to put visitors in touch with suitable lodgings and hotels.

Private hospitality in their homes has been offered by some doctors and it is hoped to develop further this aspect of the scheme.

Information about facilities for sport, travel, theatres, exhibitions, etc., will be available and visitors will thus be able to plan their leisure time as pleasantly as possible.

Ignorance of various important details and regulations concerning food and clothing rationing, petrol allowances, customs duties, etc., may be troublesome and information can be given about these and any other personal matters to enable the visitor to feel at ease as soon as possible in what must be for many a strange land.

By social functions and in other ways it is intended to enable practitioners from the Dominions and Colonies to meet each other and prominent members of the profession in this country.

Our visitors may feel there are other ways in which the Bureau can be of service, or other subjects on which they may need advice and I can assure them of our sincere intention to help make their visit to this country both pleasant and profitable.

It will obviously enable the Bureau to be of most service to a visitor if he gives me as long notice as possible of his intended visit and information on the following lines would be useful—projected date of arrival, mode of travel, if accompanied by wife, period of stay, main and other objects of visit and requirements from the Bureau. On arrival, a letter of introduction from the local Hon. Secretary of your Medical Association, whilst not essential, would be welcome.

It is my intention to send you a quarterly note on current topics and post-graduate training and periodically a summary of post-graduate courses to be held in the U.K.

The following members constitute the Committee of Management of the Empire Medical Advisory Bureau:

* * * * *

Chairman—Sir Hugh Lett, Bart., K.C.V.O., C.B.E., D.C.L., F.R.C.S. President, British Medical Association.

Members—H. Guy Dain, LL.D., M.D., F.R.C.S. Chairman of Council, British Medical Association; J. L. Gilks, C.M.G., F.R.C.S. Chairman, Dominions Committee, B.M.A.; J. A. Pridham, M.C., J.P., M.R.C.S., L.R.C.P. Chairman, International Relations Committee, B.M.A.; L. R, Broster, O.B.E., M.A., D.M., M.CH., F.R.C.S.; J. Lyle Cameron, M.D., F.R.C.S., F.R.A.C.S., F.R.C.O.G.; Brigadier E. C. Pepper, C.B.E., D.S.O.; A, E, Porritt, C.B.E., M.A., M.CH., F.R.C.S.; Charles Hill, M.A., M.D., D.P.H., Secretary, British Medical Association.

Medical Director, Empire Medical Advisory Bureau—H. A. Sandiford, M.C., M.B., CH.B., D.P.H.

The Empire Medical Advisory Bureau has been established by the Council of the British Medical Association with a view to giving a welcome and providing a personal advisory service to practitioners visiting the United Kingdom, particularly those from the Domnions and Colonies.

The services of the Bureau will include the following particular objects:

(*i*) To make available the fullest information of facilities for post-graduate study and, where necessary, to provide the necessary contacts and introductions.

(*ii*) To maintain a register of suitable lodgings and hotels.

(*iii*) To arrange for practitioners from the Dominions and Colonies to be met at the ports.

(*iv*) To supply a wide range of general information, including facilities for sport, travel, sight-seeing and entertainment.

(*v*) To arrange private hospitality in doctor's houses.

(*vi*) By social functions and otherwise, to enable practitioners from the Dominions and Colonies to meet each other and prominent members of the profession in this country.

The Council of the British Medical Association has appointed the above Committee of Management to organise and develop the Bureau and has allotted funds for this purpose.

The Council has authorised the Committee of Management to establish an Advisory Committee to include full representation of Government Departments and Societies interested in the welfare of Empire and Overseas visitors during their stay in this country for post-graduate education or other purposes.

II

WORLD MEDICAL ASSOCIATION

The following is a brief note by Dr. S. C. Sen, Honorary General Secretary, Indian Medical Association.

The first annual meeting of the World Medical Association, consisting of representatives of about 41 National Medical Associations was held in Paris between the 17th and 20th September, 1947.

A brief summary of the proceedings is given below.

Constitution

During the first part of the meeting, which took the form of a Conference of Representatives of national medical associations, various amendments were made in the draft Articles and By-Laws, which will not be revised in accordance with the decisions of the Conference and issued with the Minutes. When the Constitution, thus amended, with the following objects:—

(*i*) To promote closer ties among the national medical organisations and among the doctors of the World by personal contact and all other means available.

(*ii*) To maintain the honour and protect the interests of the medical profession.

(*iii*) To study and report on the professional problems which confront the medical profession in the different countries.

(*iv*) To organise and exchange of information on matters of interest to the medical profession.

(*v*) To establish relations with, and to present the views of the medical profession to, the World Health Organisation, U.N.E.S.C.O., and other appropriate bodies.

(*vi*) To assist all peoples of the World to attain the highest possible level of health.

(*vii*) To promote World Peace.

was adopted by the Conference, it was formally declared that:—

"In the City of Paris at 3-40 P.M. on the 18th September, 1947, the World Medical Association came into being."

The meeting then became the first Annual Meeting of the General Assembly, and Professor Eugene Marquis (France) was installed as the first President of the Association.

Dr. Charles Hill (Great Britain) was appointed Acting Honorary Secretary of the Meeting.

Headquarters

It was decided that the offices of the Association should be situated in North America, the exact location being left for decision by the Council. One of the main factors influencing this decision was the desirability of close and constant contact with the U.N.O. and W.H.O. which have their headquarters in New York.

Offer of Funds from U.S.A.

The delegates from the U.S.A. reported that certain friends of the American Medical Association being convinced of the potential value of the World Medical Association to medicine and to the promotion of world peace, and being desirous of helping to establish it on a sound financial basis, had offered to guarantee an income of $50,000 for the first year and if necessary, to continue a similar contribution for a further four years. The money was intended to be used for the provision of a permanent office, the remuneration of a fulltime Secretary and staff, and the running costs of the Secretariat. An American Committee of doctors and laymen had been set up to administer the funds. The American delegates emphasised that there was no intention of determining or interfering with the policy of the World Medical Association, the Committee's only duty being to approve the general purpose of the schemes for which the Association desired to use the donor's money. After a prolonged discussion the Association decided by a majority to accept the generous offer of its American friends and accepted the following resolutions:—

(*i*) That the General Assembly accept with gratitude the offer of the friends of the American Medical Association and place on record its deep appreciation of their generosity in making available funds sufficient for the establishment of the World Medical Association on a satisfactory basis.

(*ii*) That the funds thus made available be utilised to defray expenditure under the following headings:—

(*a*) The remuneration and expenses of the Secretary, other officials and clerical staff.

(*b*) The rent, rates and other disbursements in connection with the official headquarters,

(*c*) the general office expenses of the headquarters office staff,

(*d*) the cost of the publication of the Association's official bulletin or Journal,

(*e*) the travelling costs of the Council.

(*iii*) That the costs of the developments listed above be estimated at not more than $50,000 for the first year.

(*iv*) That the Council be authorised to act on the Assembly's behalf in appointing the Secretary of the World Medical Association and to make all other staffing arrangements, regional and other.

(*v*) That the Council be instructed to explore the possibility of making arrangements for gift funds to the World Medical Association to be made tax-free.

(*vi*) That Member-Associations be recommended to consdier the formation of W.M.A. supporting the Committees in their several countries.

(*vii*) That the Council be authorised to prepare plans for developments, to enter into any necessary consultations, and to submit its proposal to the General Assembly.

(*viii*) That nothing in these resolutions shall diminish the authority of the General Assembly for the full control of the policy and affairs of the Associations as provided in Article 8.

Subscription

The acceptance of the American offer does not, of course, relieve of the Association of the necessity of collecting its own subscription income. After consideration of the report of the Honorary Treasurer and of the possible methods of assessing subscriptions, the General Assembly adopted the following resolutions:—

(*a*) That the subscription of each Member-association be calculated at a flat rate per member with a minimum total and a maximum total.

(*b*) That the flat rate per member be 20 Swiss centimes, with a minimum of 1,000 Swiss francs and a maximum of 10,000 Swiss francs.

Membership Roll

In accordance with Article 5(*i*) those national medical associations which were represented at the London Conference in September, 1946, were accepted as Founder Members. During 1946-47 the Organising Committee, which was instructed by the Conference to proceed with the organisation of the Association, invited all national medical associations to apply for membership and those applicants which appeared to fulfil the conditions of the Article 5(*ii*) were accepted as members.

As soon as the Constitution was adopted by the Paris Meeting the procedure laid down in By-law I came into operation. Italy (La Federazione Nazionale delgi Ordini dei Medici Italiani) made a written application for membership to the General Assembly and was accepted. Certain difficulties then arose in connection with the associations in Latin-America and the General Assembly eventually decided to request the Council to submit for examination by next year's General Assembly the applications of all Member-associations.

Secretariate

As has been stated above, the General Assembly left to the Council the question of the general organisation of the secretariate. It considered, however, the desire expressed by the Latin-American associations for the specific recognition of the Spanish culture in the Association's organisation. They proposed the adoption of Spanish Assistant Secretary whom they offered to finance without cost to the Association. The Assembly adopted the first proposal. With regard to the second, it recognised that, with the development of the Association's work, it might become desirable to appoint, perhaps, several Assistant Secretaries in different parts of the World. It therefore instructed the Council to include this matter in its consideration of the general organisation of the secretariate and recommended for acceptance the kind offer of the Latin-American associations.

Proxy Voting in Assembly

The General Assembly referred to the Council for consideration a suggestion by Australia that provision should be made in the By-laws for voting by proxy in the General Assembly, in order that far distant Member-associations, which might be unable to send delegates to a meeting of the General Assembly, should not thereby lose their voting power.

War Crimes

After a discussion of the motions on the agenda by Denmark and Great Britain and the British memorandum relating to the attitude of the profession to war crimes, and after hearing statements by members of the Assembly and by a French victim of War crimes, the Assembly appointed a small committee to formulate a recommendation. The following report of the committee was subsequently adopted by the Assembly.

(1) That a report on crimes committee since 1933 by doctors and medical organisations in Germany and other Countries and on this violation of the medical ethic, be prepared and made available to doctors throughout the World.

(2) That the World Medical Association solemnly condemns the crimes against human beings committed by certain members of the medical profession such as are described in the British memorandum.

(3) That every doctor, at the time of his receiving his medical degree or diploma, be required to subscribe the following oath.

> "My first duty, above all other duties, written or unwritten, shall be to care to the best of my ability for any person who is entrusted or entrusts himself to me, to respect his moral liberty, to resist any ill-treatment that may be inflicted on him, and, in this connection, to refuse my consent to any authority that requires me to ill-treat him.
>
> Whether my patient be my friend or my enemy, even in time of war or internal disturbances, and whatever may be his opinions, his race, his party, his social class, his country or his religion, my treatment and my respect for his human dignity will be unaffected by such factors."

(4) That the World Medical Association endorse judicial action by which members of the medical profession who shared in war crimes are punished.

(5) That the World Medical Association request the German medical syndicate to make the following public declaration.

(*a*) We, members of the German medical syndicate, are aware of the very large number of acts of cruelty committed both by individuals and collectively, since 1933 in Mental Hospitals and concentration camps, and of the violation of the medical ethic. These acts have resulted in the death of some millions of people. A large number of our members have been implicated in these acts, either as instigators or as technical agents or as actual perpetrators;

(*b*) We regret that the organised medical profession in Germany has not made any protest and has been content to ignore these acts, of which it could not have been unaware.

(*c*) We undertake solemnly to condemn these crimes, to expel from our organisation the criminals who have committed them, and to remind all our members of the respect due, not only to life, but to human personality, dignity and liberty.

The Assembly instructed the Council to prepare a report incorporating these resolutions and also to take into consideration the following motion by the Netherlands:—

That the Council be instructed to prepare a report on the collaboration of medical practitioners in the preparation of means of warfare.

Matters Referred to Council

During the course of the meeting, the General Assembly also referred the following matters to the Council for appropriate action or investigation and report:—

(*i*) The General arrangements for the organisation and publication of a bulletin or journal.

(*ii*) The preparation of a report on the enquiry into the present position of the medical profession in relation to the State.

(*iii*) The motion of Luxemburg, supported by Australia, recommending the preparation of a comparative statement on standard of training for the medical profession and conditions of registration, and of a comparative statement on the qualifications of specialists.

(*iv*) The following motions by India:—

(*a*) That the Council be requested to study and report on the question of the advertisement of cures and medicines in the lay press.

(*b*) That the Council be requested to study and report on the question of unqualified and unauthorized medical practice.

(*v*) The preparation of Standing Orders to govern the procedure of meetings of the General Assembly.

(*vi*) The appointment of auditors.

* * * * *

Second Annual Meeting of the General Assembly, 1948

The General Assembly decided to hold its 1948 meeting in Prague, the exact date being left to the Council to decide.

President-Elect, 1947-8

The General Assembly elected Dr. J. Stucklich (Czechoslovakia) to preside over its Annual Meeting in 1948. He therefore becomes President-Elect for the 1947-8.

Treasurer, 1947-50

The General Assembly elected Dr. O. Leuch (Switzerland) as Treasurer of the Association for the period 1947-50.

Council, 1947-48

The General Assembly elected the first Council, Dr. Zahora (Czechoslovakia) and Dr. Glorieux (Belgium) having resigned after election, the Council for 1947-8 is composed as follows:—

Ex-Officio President—Professor E. Marquis (France).

President Elect—Dr. J. Stucklich (Czechoslovakia).

Treasurer—Dr. O. Leuch (Switzerland).

Chairman—Dr. C. Routley (Canada).

Vice-Chairman—Dr. D. Knutson (Sweden)., Dr. L. H. Bauer (U.S.A.), Dr. J. A. Bustamante (Cuba), Dr. P. Cibrie (France), Dr. A. Hartwich (Austria), Dr. P. Z. King (China), Dr. J. A. Pridham (Great Britain), Dr. S. C. Sen (India), Dr. L. G. Tornel (Spain).

At the conclusion of the General Assemly's proceedings the Council held its first meeting.

Pending the establishment of a permanent office and the appointment of a full-time Secretary, the Council appointed Dr. Charles Hill (Great Britain) as Honorary Secretary of the Association with temporary headquarters at B.M.A. House, London.

The Council will consider the conditions of service to be offered for a full time Secretary and will make arrangements for receiving and considering applications for the appointment. It hopes that the national medical associations will make known in their countries the offer of the appointment so that the field for the selection of the right person may be as wide as possible.

NOTES AND NEWS

INTERNATIONAL CONGRESS ON INDUSTRIAL MEDICINE: INDIA INVITED TO LONDON CONFERENCE

India has been invited to send representatives to the Ninth International Congress on Industrial Medicine to be held at Caxton Hall, Westminster, London, between September 13 and 17, 1948.

The British Organising Council, which has been given the responsibility of holding the Congress in Great Britain, anticipates that representatives from at least 22 countries will attend the Congress and take part in its deliberations.

This is the first International Congress of its kind to be held for 10 years. The Congress will consider recent advances in the practice of industrial medicine and research into many of the facets of modern industrial life.

The British Organising Council has offices at Room 501, Garden Court Wing, B.M.A. House, Tavistock Square, London, W.C. 1.

INTERNATIONAL SOCIETY OF HAEMATOLOGY

The International Society of Haematology will hold its bi-annual meeting at the Hotel Statler, in Buffalo, New York, August 23-26, 1948.

The following time has been tentatively allotted for symposis and presentations; ½ day on general subjects, including radio-active and stable isotopes in hæmatology, ½ day for problems and diseases related to the red cells, ½ day for problems and diseases related to white cells, 1 day for immuno-hæmatology, Rh-Hr (CDE-cde) antigen and anti-bodies, and hemolytic anemias, ½ for coagulation problems and hæmorrhagic diseases and ½ day for business meeting.

Scientific exhibits will be presented in the South wing of the 17th Floor of Hotel Statler. Applications for the presentation of scientific exhibits are now being received by Dr. O. P. Jones, Department of Anatomy, University of Buffalo, Buffalo, New York. Chairman of the Program Committee is Dr. Ernest Witebsky, Buffalo General Hospital, Buffalo, New York.

Dr. Eduardo Uribe Guerole, Leibnitz 212, Nueva Colonia Anzurez, Mexico, D.F. is in charge of the program from South and Central America and Sir Lionel Whitby, University of Cambridge, Cambridge, England, is in charge of arrangements for the program from Europe. Communications concerning applications for the program will be received by the above named committeemen.

All scientific sessions and exhibits will be open to scientists interested in hæmatology. This will, of course, include members of the medical profession and those branches of science dealing with hæmatology, such as biochemistry, biophysics, genetics, immunology etc.

Communications and applications concerning membership from India will be received by Dr. C. R. Das Gupta, (Hæmatology Department, School of Tropical Medicine, Calcutta) a member of the membership committee.

SYNTHESIS OF VITAMIN A

The oil-soluble Vitamin A was discovered as early as 1913, its composition having been known since 1931. So far it has proved impossible to prepare this vitamin artificially, which is possible for all the other vitamins. Nobody has ever been able to confirm the statement published by Kuhn and Morris in 1937 that they should have succeded in synthesizing Vitamin A, though the problem has been studied in many laboratories all over the world. After 4 years' research, Dutch chemists (in Pharmaceutical Industry), Dr. J. F. Arens and Dr. D. Ven Dorp have succeeded in synthesizing this vitamin in the Organan Laboratories at Oss (Holland).

Both for medical purposes and for the vitaminization of foodstuffs (*e.g.* margarine) highly concentrated vitamin A preparations are required. Until now these products could be prepared only from fish-liver oils, which are largely lacking throughout the world. Dutch investigators (Eykman & Grijns, Jansen & Donath) had earlier performed spadework in the vitamin B_1 field, and further chemical work in the vitamin field was done, for the greater part, in America.—*Science & Culture.*

AUSTRALIA'S FREE MEDICINE SCHEME

There will come into operation shortly throughout Australia a scheme to provide all persons ordinarily resident there, without cost to themselves, with such pharmaceutical benefits as are necessary for their treatment.

The scheme, part of the Federal Government's health and social services programme, is authorised by a Federal Act, passed in 1947, which provides for the compilation of a formulary clearly defining the scope of the benefits to be available. The work of compilation is placed in the hands of a permanent committee, comprising a chairman and six members. Three of the committee are medical practitioners, and it includes pharmacologists and pharmacists. The committee will review the formulary at regular intervals to keep the range of medicines abreast of medical science and experience.

A prescription, which must be in authorised form and signed by a medical practitioner, will be presentable to any chemist or dispensary approved under the Act. Apart from such extras as special postage or delivery costs, or a small charge for prescriptions supplied outside usual trading hours, which must be paid by the patient, the prescription will be supplied free of charge. However, all prescriptions, to receive the benefit of the Act, must consist of items included in the formulary. Since this contains a full list of drugs and medicines in common use, it is hoped that the public will receive a service not only as good as present practice, but actually better, because of the elimination of drugs long since superseded.

Newer Drugs Included—The formulary compiled by the committee and known as the Commonwealth Pharmaceutical Formulary, includes all the newer drugs, such as penicillin and the sulphonamides, as well as a full range of formulæ used in modern medical practice. No medicine has been or will be excluded on the ground of cost, and all new therapeutic agents which have satisfied clinical investigation have been added, while others will be added as they appear. The formulary also includes a restricted range of surgical dressings and medical appliances.

The medical practitioner will write on the authorised form the name of the drug, formula, surgical dressing or medical appliance included in the formulary which he is prescribing, and his directions for use. This will be supplied by any approved chemist or dispensary. Where the practitioner prescribes a continuation of the treatment over a period, he may authorise the chemist to repeat the prescription a specified number of times. All approved chemists and dispensaries will display a coloured sign containing the Australian coat-of-arms and the words "Approved Pharmaceutical Chemist".

Complaints Committees—At the end of each month, each approved chemist or dispensary will forward to the Federal Department of Health for payment, all prescriptions dispensed. A special committee in each State will deal with complaints or disputes and make recommendations on each to the Director-General of Health.

Where no pharmaceutical services are available, local medical practitioners will supply benefits. Benefits will be available to all patients receiving treatment in or at hospitals.

To guarantee the quality and quantity of drugs used in benefit prescriptions, a careful check will be kept from the inception of the scheme, and arrangements for the proper testing of medicines have been made.

THE PROGRESS OF MEDICAL SCIENCE IN THE U.S.S.R.

Academician Alexei Abrikosov, Vice-President of the Academy of Medical Sciences of the U.S.S.R. writes:

Soviet medical science occupies a leading position in a number of important branches of world medical science. A few examples will suffice. The colleagues and followers of the great Russian scientist Ivan Pavlov are holding priority in the development of the science of the physiology of higher nerve activity. Academician Nikolai Burdenko, the brilliant surgeon, has created an important branch of general surgery—neuro-surgery. The "wandering stalk" method of plastic operations proposed by Vladimir Filatov, leading Soviet oculist, has received world recognition. The experience of Soviet physicians in blood transfusion during the Great Patriotic War is unequalled in the history of medicine.

What facilitates the progress of medical science in the Soviet Union? What inspires the creative thought of the scientists and leads them to ever new discoveries for the benefit of mankind? In this short article I have no chance of giving an exhaustive answer to all these questions. But I consider that my experience, my more than 40 years of scientific work, which began immediately upon my graduation from Moscow University in 1899, gives me the right to sum up certain results in connection with the thirtieth anniversary of the October Socialist Revolution.

There is no country in the world where so much attention is paid by the government to science and scientists, as in the Soviet Union. I recall the following vivid example. In 1918-20 the young Soviet state was fighting for its life against the foreign interventionists and internal counter-revolution. But even in those hard days, Vladimir Lenin, the creator of the Soviet state, signed a decree providing every condition necessary for Academician Ivan Pavlov to continue his scientific research work. And despite great material difficulties, these conditions were created.

I can cite another example, showing the paternal care of Joseph Stalin, the continuator of the cause of Vladimir Lenin, for the development of Soviet science. The Great Patriotic War against the German fascist invaders cost my country great efforts. The enemy temporarily occupied considerable territories. Many cities and districts were reduced to ruins. But in June, 1944, when the battles for liberating Belorussia from the Hitler hordes were raging, the Soviet government, on Stalin's proposal, adopted a decision on the establishment of an Academy of Medical Sciences. It was set up as the centre of medical scientific thought, with numerous research institutions representing every branch of theoretical medicine.

Since then the scope of the Academy's work as well as its budget grew yearly.

The second circumstance which, in my opinion, to a great degree pre-determined the success of medical science in the U.S.S.R. is its close bonds with the people. Never in the history of mankind have scientists worked so purposefully as in the Soviet Union. Our scientists can see the results of their achievements in practice. New effective methods of treatment, new medicines, become the property of every physician in the U.S.S.R. They are used not only in the hospitals and clinics of the large cities, but also in the hospitals of the off-lying districts, in village medical centres. The Soviet system of public health protection is based on the principle embodied in the fundamental law of the Soviet State—the Stalin Constitution—of rendering qualified medical aid, free of charge, to all citizens. The desire to serve the people inspires our physicians and is beyond doubt an important incentive to their creative work.

The genuinely democratic principles on which the system of higher education of the U.S.S.R. is based, promote the progress of medical science, as that of every other science. Soviet youth, regardless of sex or nationality, have full access to every higher school. The Soviet government has created every condition for the practical utilisation of the right to higher education. Whatever Union or Autonomous Republic we take, be

it ever so far situated from Moscow—the Kirghiz, Tadjik or Turkmen—everywhere we see now medical institutes. There are 57 medical institutes alone in the Soviet Union, besides eight specialised stomatological and 9 pharmaceutical institutes. There are also special institutes for the advanced training of physicians. Towards the outbreak of the war the number of physicians in the Soviet Union was seven times that of 1913 and had reached the figure of 140,000. Many of them are engaged in scientific research. Three thousand five hundred persons are on the staff of the Academy of Medical Sciences alone.

I am quite sure that the successes of Soviet medical science are in no small measure due to the outstanding talents of Russian Soviet people, their great capacity for scientific research work. Indeed, even in pre-Revolutionary Russia, when the annual number of physicians graduated from the higher schools equalled only 1,500 persons, when higher medical education was hardly accessible to the working people, Moscow alone gave such splendid surgeons as Pirogov and Sklifasovsky, such an outstanding therapeutist as Zakharyin, such a pediatrist as Filatov. Under Soviet power, when the government is giving its full support to the scientist's initiative, when along with the Academy of Medical Sciences we have dozens of scientific research institutions, we can speak of the achievements not of individual scientists, as was the case in pre-Revolutionary Russia, but of the successes of whole scientific trends, of large scientific schools; etc.

Planning is of great importance for the development of medical science. While reserving for every scientist freedom of choice of scientific problems to be studied, planning concentrates the attention of Soviet scientists on leading key problems of theoretical and practical medicine. It co-ordinates the efforts of scientific workers and helps them solve these problems in the shortest period of time.

I would like to conclude this analysis of the causes of the achievements of Soviet medical science by saying a few words about the right to creative risk. Not every problem conceived and even worked out in detail can be successfully solved at once. Some times, unfortunately, one has to wait for a long time. We Soviet physicians in our scientific medical research institutes understand the inevitability of creative risk and are not afraid of it, we let our scientific workers take their time in solving various complex problems.

Above I have mentioned a few circumstances which, in my opinion, promote the development and progress of Soviet medical science.—*U.S.S.R.I.S.*

JOURNAL OF BONE & JOINT SURGERY

Sir Reginald Watson-Jones, Editor, writes:

After consultation with the Dominions of Canada, Australia, the Union of South Africa, and the Colonies, and after receiving in this country a delegation of surgeons from the United States of America, it has been decided to establish a new Journal of Bone and Joint Surgery which will be shared equally by the Nations of the British Commonwealth and the United States of America. From January, 1948, there will be eight annual issues, four British Numbers published in London, alternating with four American numbers published in Boston.

This development is unique in the history of surgical publication. Never before have the Nations of the British Commonwealth shared equally in such a task. Never before has there been equal partnership in such activity between the British Commonwealth and the United States. It is believed that the standard of publication will be unusually high, and certainly it will represent surgical progress and advance throughout the English-speaking world.

The Journal will not be limited to the field of a narrow speciality. Early British numbers will include not only contributions on fractures and joint injuries, nerve lesions and paraplegia, reviews of mould-arthroplasty of the hip and operative leg lengthening, analysis of nearly 500 cases of recurrent dislocation of the shoulder and 101 cases of traumatic dislocation of the hip, a serial atlas on general skeletal affections, and a study of plasma cell tumours of the viscera in relation to leukæmia and tumours of bone; they will also include contributions of historic and traditional interest, with appreciations of Lister, Hunter, Thomas, Robert Jones and others; and finally they will include studies in arterial ischæmia and ischæmic pain, traumatic uræmia and the dual circulation of the kidneys, alimentation of hormones and the physiology of bone, and a stimulating thesis by an anatomist.

In short the Journal will reflect the truth that orthopædic and traumatic surgery is indeed the half of surgery and that it depends no less than visceral surgery upon recent developments in the basic sciences. No surgeon, general or special, can afford to ignore the contributions of the English speaking world, and since unfortunately there is limitation in the supply of paper no surgeon can expect to receive this Journal unless his order is received in advance.

MADRAS MEDICAL COUNCIL

Dr. V. Govindan Nair, Registrar, Madras Medical Council writes:

Information having been received from the Superintendent, Special Branch, C.I.D., Mylapore, Madras, through the Government of Madras by the Madras Medical Council alleging that Dr. (Miss) K. Carlsen M.B.CH.B. (EDIN.), Medical Superintendent, Danish Mission Hospital, Tirukoilur made a palpably misleading report in regard to the death of a child Suganthi treated by her in the Danish Mission Hospital, Tirukoilur whose death was certified by the said Dr. (Miss) K. Carlsen to be due to General Peritonitis, though it was alleged to have been caused by gun shot injury. The Council held an enquiry on 22-3-48 and found her guilty of infamous conduct in a professional respect and in exercise of powers conferred on it by Section 16(2) of the Madras Medical Registration Act (Act IV of 1914) the Madras

Medical Council directed that the name of Dr. (Miss) K. Carlsen daughter of Mr. J. H. Carlsen and holder of Medical Registration certificate No. 4023 dated 30th December, 1927 be erased from the Madras Medical Register for a period of one year from 22nd March, 1948.

INDIAN PSYCHIATRIC SOCIETY

A quarterly Indian Journal of Psychiatry will be published next year and distributed free to all members.

The list of the office-bearers for 1948:—

1. Dr. Nagendranath De, M.B.D.T.M., M.R.C.P., D.P.M.,—*President.*

2. Dr. J. Roy, M.B., D.P.M.—*Vice-President.*

3. Dr. R. B. Davis, M.B., M.R.C.S.,—*Hony. Secretary and Treasurer.*

The fee for membership is Rs. 10/- per annum. Applications for membership can be obtained from R. B. Davis, Major, D.S.O., Hony. Secretary and Treasurer, Indian Psychiatric Society, C/o Inter-Provincial Mental Hospital, Kanke, Ranchi.

COLLEGE OF PHYSICIANS AND SURGEONS OF BOMBAY

The College of Physicians and Surgeons of Bombay held the D.G.O., D.C.H. and First M.C.P.S. Examinations in April, 1948.

The following candidates have passed the D.G.O. Examination:—Bhagwat, Vimal Vishwanath (Miss); Deshmukh, Susheela Bhaskarrao (Mrs.); Dhake, Yeshoda Thakurdas (Mrs.); Gupta, Satya Wati (Miss); Malia, Jogindar Kaur. (Mrs.); Moulvi, Kamartaj (Miss); Naik, Kalyanibai Kashinath (Mrs.); Patwardhan, Kamala Vishwanath (Mrs.) and Shaikh, Zubaidakhatoon Qamaruddin (Miss).

The following candidates have passed the D.C.H. Examination:—Joshi, Jagannath Hari; Khalap, Narayan Vaman; Noronha, Ligorio Nicolau Antonio Cabral De; Patwardhan, Vishwanath Laxman and Sethi, Bimla (Miss).

The following candidates have passed the First M.C.P.S. Examination:—Bapna, Yeshwantsingh; Manekshaw, Manek Jamshed; Marathe, Bhalchandra Balwant; Mehta, Manharlal Padmshi; Merchant, Vasant Bhagawandas (Miss); Patel, Manubhai Ramanlal and Vyas, Nirmala Bhanushanker (Miss).

MEDICAL COUNCIL OF INDIA

The Medical Council of India met for its twenty-eighth session on 28-2-48 at New Delhi, under the presidency of Lt.-Col. Dr. Abraham S. Erulkar. Twenty-two members were present.

The President in his address made reference to Mahatma Gandhi's death and the Council adopted the following resolution moved from the chair all standing:

"The Medical Council of India places on record its deep sense of grief at the assassination of Mahatma Gandhi, the Father of the Nation and offers its respectful homage to his memory."

Dr. K. S. Ray was re-elected Vice-President of the Council for two years.

The Council noted the Central Government notification placing the M.B., B.S. degree of the Agra University on the First Schedule to the Indian Medical Council Act, 1933.

The Council accepted the principle of recognition for purposes of registration by the Provincial Medical Councils of foreign medical qualifications which are not already on the second schedule to the Indian Medical Council Act, 1933, when held by the Indian Nationals provided the applications for registration of the holders of such qualifications are, in the first instance, received and decided by the Executive Committee of this Council on the merits of individual qualifications so that there may be uniformity in recognition and registration.

Dr. H. G. D. Mathur was appointed as Secretary of the Council.

The next meeting of the Council was fixed for Saturday, the 23rd October, 1948.

* * * * *

The following is the President's Address at the Twenty-eighth Session of the Medical Council of India:

We meet to-day under the shadow of a very heavy national loss by the death of Mahatma Gandhi. He did not belong to India alone. He was one of the greatest men of all time. This Council pays its tribute to his memory.

We welcome to our deliberations Lt.-Col. M. V. Ramanamurti as representative of the Andhra University, Dr. Bhupal Singh, representative of the Government of United Provinces and Dr. Balabhadra Mishra, representative of the medical graduates of Orissa.

I am sure you will wish me to offer our congratulations to Dr. B. C. Roy on his appointment as Premier of West Bengal. I wish him every success and hope that we will continue to have his advice and counsel here.

The question of permanent recognition of the M.B., B.S. degree granted in the States of Hyderabad and Mysore has been engaging the attention of your Executive Committee. The authorities in Hyderabad are not yet ready for an inspection on behalf of this Council. The Dewan Sahib of Mysore was anxious to have a visitation by this Council, but as he was going abroad the visitation could not be carried out. Meanwhile I have directed enquiry from the Central Government as to the position of the Council *vis-a-vis* Indian States under the new constitutional set up.

Arrangements have been made to carry out the second round of inspections during March-April this year of the courses of instruction, facilities for teaching and standards of examinations in the pre-clinical and clinical subjects at the old and new medical institutions affiliated to the Universities of Andhra, Calcutta and Lucknow. As the Inspector in the subject of Physiology at the Patna University could not carry

out the inspection in October last, it is being done now.

On a request from the Utkal University, Inspectors have been appointed to inspect the Final M.B., B.S. Part I examination and the courses of instruction at the University on behalf of this Council.

The draft suggestions for the appointment of Examiners drawn up by the Minimum Requirements Sub-committee are being considered by your Executive Committee.

As advised by this Council the Central Government have placed the M.B., B.S. degree of the Agra University on our first schedule.

Under the direction of your Executive Committee relevant extracts of the visitation report at the Gajra Raja Medical College, Gwalior, showing the defects pointed out therein, have been forwarded for information to the Agra University and the college authorities.

Your Executive Committee has learnt with great pleasure that the Ministry of Health has been able to make arrangements for the admission of students belonging to the King Edward Medical College, Lahore, Balak Ram Medical College, Lahore and the Dow Medical College, Karachi, into our medical colleges thus helping those students to complete their medical studies.

Your recommendation regarding the deletion of footnote (*c*) under the Second Schedule and consequential changes in the footnotes and the schedule is receiving the consideration of the Central Government.

Your Executive Committee is considering the question of reciprocity between India and Victoria and as directed, enquiries have been made from the Medical Board of Victoria as to whether there is any law in the Territory preventing the Indian Nationals to domicile in Victoria or to get admission to any University there.

A communication has been received from the Central Government intimating that certain Indian medical qualfications have been recognised in South Africa and enquiring whether the Medical Council of India desired that the South African medical qualifications granted after the 31st March, 1942 should now be recognised in India. The matter is receiving the consideration of your Executive Committee. This Council entertains reciprocity only if it is direct.

In March, 1947, you decided to open up fresh negotiations for establishing reciprocity with various countries and authorised Dr. B. C. Roy to find out the standard of medical qualifications and the possibility and basis for reciprocity with the countries and States he would be visiting. The report of Dr. Roy, in this connection, is being considered by the Executive Committee.

Your Executive Committee is reconsidering the question of the recognition of the qualifications of sufficiently high standard not on our Schedule, when held by Indian Nationals.

You may remember that in October, 1946, you had approved the Standing Orders of the Council to substitute the existing rules relating to the conditions of service, powers and duties of the Council servants. These Standing Orders have now been printed and copies are already in the hands of the members.

For various reasons the yearly volumes of our Minutes could not be printed after March, 1945. Volume XI covering the minutes upto 1st April, 1946 has been supplied to you.

Your office has prepared for Council members a resume of the decisions taken by the Council ever since its inception. I trust this will be a useful guide to the members.

The Central Government has forwarded to us a copy of an extract on 'Nutrition Education' of the report of the Standing Committee on Nutrition of the Food and Agriculture Organisation of the United Nations held in Copenhagen which is receiving the attention of your Executive Committee.

The position with regard to the proposed All-India Medical Register is the same as reported to you previously.

As a result of the Punjab University being in Pakistan, the East Punjab University has been established with a medical faculty. The University has for the time being adopted *en bloc* all the rules and regulations governing the award of the M.B., B.S. degree, in operation in the former Punjab University. The question of the recognition of the M.B., B.S. degree of the East Punjab University by this Council is receiving the attention of your Executive Committee.

We are very anxious that our relations with the General Medical Council should improve. While we have included in the Second Schedule for purposes of recognition all the British qualifications shown in Table 'F' of the British Medical Register, the General Medical Council has not recognised all the Indian qualifications included in our First Schedule. I have, therefore, placed this matter before your Executive Committee and I hope the General Medical Council will co-operate with us in establishing fair reciprocal relations between the two countries.

CHEMICAL AWARD TO MERCK

The eighth biennial award for chemical achievement goes this year to Merck & Co., Manufacturing Chemists, Rahway, N. J. George W. Merck President will accept it for his company during the Exposition of Chemical Industries in New York.

The award is made by Chemical Engineering, a McGraw-Hill publication, of which Dr. S. D. Kirkpatrick is editor. It goes to Merck specifically for pioneering in the large-scale production of streptomycin.

Soon after discovery of streptomycin in 1944, Merck's laboratories began developing it. In 1945 the War Production Board authorized construction of two Merck plants to mass-produce it. By early 1947 output had reached over 500,000 grams a month.

CORRESPONDENCE

The Editor is not responsible for any views expressed by contributors

NEED OF PLANNED MEDICAL TRAINING IN FOREIGN COUNTRIES

Sir,—Recently I have been to England and to various other countries in Europe to study tuberculosis and anti-tuberculosis work, as a Government scholar. I feel that my experiences in this respect, specially as regards available training facilities, difficulties of admission in educational institutions etc., will be useful for others willing to go abroad for training or higher studies. Moreover as the Government is spending large sums of money in sending students abroad it should be seen that the scholars are trained in such a way that a maximum benefit for the country can be obtained out of them. From my personal experience as a Government scholar abroad I have felt that the system through which these arrangements are made leave much to be desired. As the I.M.A. is going to play more and more important role in the planning of medical aid and education of the country, I am relating my experiences and making some suggestions through your esteemed journal.

We were told after our selection that due to extreme difficulty in securing admission in educational institutions in U.K. and U.S.A. there will be indefinite delay in sending us abroad. This is quite true. Nearly half the scholars selected in 1946 have not yet been able to secure admission abroad.

In England certain institutions and hospitals run post-graduate courses on various special subjects. These courses usually conform to a syllabus for particular diplomas of certain specialities. There is a very great rush for these courses. The seats for these courses are allocated mainly through the British Post-graduate Medical Federation, who allot a limited number of seats for Indian students recommended by the Director General of Indian Medical Services. Government of India scholars usually get a preference for these courses.

There are however a large number of other hospitals and institutions in England, where actual work on any branch of medical speciality is done on a very high standard, and post-graduate students may attend these hospitals under the physicians or surgeons in charge. Although there are no regular coaching or demonstration classes, the student may work as a house staff (unofficially), take part in various discussions, observe the routine management of cases, learn the operation and diagnostic techniques. A very good practical training may thus be obtained. In fact the British Post-graduate Medical Federation has placed several students in such institutions. For such arrangement direct contact with the physician or the surgeon concerned or with the Superintendent or Director of the institution is helpful. Such contact is best done by the scholar himself, but it is not always possible for him to get the necessary informations. At present the education authorities in the High Commissioner's office in London do not offer much help in this direction. Various non-official organisations, like the National Association for Prevention of Tuberculosis in U.K. or the Empire Rheumatic Council, etc., are very helpful in this respect.

Besides such hospitals in England, there are plenty of institutions in the various countries of Europe where such facilities for training can be obtained. In most European countries there are no special diplomas for different branches of medicine. To specialise in any particular branch of medicine one has to work under a Professor or a specialist on the subject for 2 or 3 years and then obtain his M.D. on some research work on the subject. I have been fortunate in being able to attend some of the well-known hospitals in Denmark, Norway and Sweden under distinguished Professors and chest specialists. Most of these Professors speak English and there was no difficulty in our conversation. I was treated as colleague by all, and the intimate personal touch in our relations was very beneficial to me in learning their points of view on various problems. There is not much rush of students in these places. There are no lectures to attend but from early morning to late afternoon one learns at each step at the bed-side, at the operation theatre or at the post-mortem room. In France, Switzerland and Italy also there are some very good institutions, but there is some difficulty about language in these countries.

The educational authorities in the High Commissioner's office in London are happy with those students who take up some degree course in an university. Once the student is admitted, he has only to submit a quarterly report on his progress. He continues for one, two, or more sessions as the case may be, and the office only has to send his monthly allowance in time and keep a file for his papers. The difficulty arises with the students of technical subjects who do not want to attend any such degree or diploma course. The present machinery in the education dept. is wholly inadequate to arrange for a really worthwhile programme for training of such students. On the other hand the hard and fast rules and official red-tapism make it difficult for the students to take the initiative themselves. Although students are allowed to negotiate directly with authorities of suitable institutions for training facilities no definite promise is given as to whether they will be allowed to go and join them. Thus when with the permission of the authorities I have myself secured certain facilities in some well-known institutions in Europe for training, I had to change the date of my joining them twice before the necessary formalities of an official permission was obtained. Moreover although after prolonged correspondence on my own initiative admission in two very well-known institutions in the U.S.A. was obtained, the Government declined to allow me to go and join them.

Most of the men selected for scholarship lately are not very young fellows just out of the College, but are fairly senior professional men or officers holding responsible positions, some of them themselves teachers. They should be relied upon to say for themselves as to what type of work or training they want. Instead of that, the rules of the education department are such that even for buying a book with the Govern-

ment allowance, like schoolboys they have to go and ask the Professor, (who sometimes is almost like his colleague), to recommend the book he wants to read as good for him.

The greatest difficulty is the lack of any clear cut plan. Moreover the training arrangements when they are made, are done without taking into account the exact requirements of the scholar concerned. So that sometimes a scholar with much advanced knowledge is placed into a course of a most preliminary nature, or for a diploma course, whereas he could have certainly more benefitted by being attached to a hospital as resident or a post-graduate observer. I feel the scholars should be taken into confidence or consulted more and more in fixing the course of studies. Then again when a scholar finds good facilities in one institution and wants to continue in the same, he is shifted to some other institution.

Besides, I feel that the present policy of offering facilities to individual students for specialising in certain subjects is fruitless unless it is first determined as to how their services are going to be utilised. There are several reasons why the present arrangements make it difficult for them to utilise the training they obtain abroad. Firstly, the modern practice in almost every speciality in medicine is to obtain more and more precision in diagnosis and treatment with the help of highly skilled technical, mechanical and laboratory aids. This naturally requires elaborate and expensive equipments, co-ordinated team work of clinicians, technicians, laboratory workers, surgeon, physiotherapist, social workers, etc. An individual student trained, however thoroughly, in an upto date western institution is totally a misfit in our institutions in India. To start with, he is put into such a position that he is never allowed a free hand, and then even if he gets a chance to do something, he finds himself handicapped in all respects. Secondly, whereas the tendency in the western countries is to make a distinction between 'mass work' and specialised work, here in our country the authorities are more concerned with 'mass work', and highly skilled specialists are wasted by being employed to do a lot of routine stereotyped work. It is certainly necessary to give medical aid to as large number of people as possible. But it should be realised that a large number of sick people require only hospitalisation, nursing and routine straight forward treatment. For these classes of cases there are, what are known as, country or regional hospitals in England. Highly skilled specialists are not required in these hospitals except as consultants. There are however a number of other cases which offer diagnostic problems, require prolonged laboratory investigation or observation. For these there are special hospitals with highly skilled team of specialists. In our country the best hospitals are called upon to serve on a mass scale, so that a large number of beds are occupied by cases which do not require any highly specialised attention. If it is agreed that our resources being limited, we should now endeavour to give even some service to as many as we possibly can, instead of giving best possible service to a few, then let not Government money and students' time be wasted by sending them abroad for special training. That money and those personnel can be utilised here for creating more and more hospitals with ordinary equipments. Let us train more nurses and more doctors for general practice.

The time has now come to make a distinction between general hospitals and special hospitals. Merely opening of special departments in a general hospital will not touch even a fraction of the problems.

Thirdly, it is to be realised that no specialist can work without a highly skilled supporting team of workers and without proper equipments as mentioned above. It is no use sending somebody to learn thoracic surgery unless at the same time an anæsthetist, radiologist, physiotherapist, etc., are also trained. Moreover special anæsthetic apparatus, surgical instruments, operation table, tomographic and stereoscopic radiological facilities, broncho spirometry apparatus, etc., are also to be made available. The same is also more or less true for other specialities. When therefore the time comes for creating special hospitals the award of scholarships should not be made to individuals but to a team of workers who will also be assured that they will be given full facilities for work when they are trained. I am etc.

P. K. CHATTERJEE,
M.B. (CAL.), M.R.C.P. (LOND.)
19, Sardar Sankar Road,
Calcutta, 5-5-48.

COAGULATION TIME AND ANTIBIOTICS

Sir,—In the November, 1947 issue of the Journal (page 63), you have quoted on the above subject from *Brit. M. J.* Findings of several authorities mentioned, go to prove that both penicillin and streptomycin increase the coagulability of blood. In line 18, however it is mentioned "the increase in the time of clottting was usually noted". This means retardation of clothing. In line 36 it is mentioned. "Streptomycin, too, has the effect of increasing the coagulation time of blood in cats and rabbits." In the second paragraph Frada has attributed four embolic accidents to penicillln. Even dicumarol has been suggested to overcome the thromboplastic action of penicillin. Now, Sir, don't you think this is a bit confusing?

Investigations carried out by Sir Alexander Fleming and Dr. Best, and published in one of the August numbers of *Brit. M. J.*, go to show that penicillin retards coagulation. Now, what has one to believe? In a case I had in February, 1946, my experience led me to think that penicillin had definite effect in helping coagulation. A boy of 11, who had been operated for enlarged tonsils and adenoids, elsewhere, eight days previously, was brought to me for bleeding from nose. Tonsillar beds were dry, so I concluded that bleeding was from the adenoids. Almost

all the known coagulants, were tried—calcium gluconate, coagulin, Redoxon (Forte) and vitamin K, but with temporary effect. As these late hæmorrhages are usually due to secondary sepsis, penicillin 15,000 units was injected, and bleeding ceased. Penicillin injections were repeated every three hours till a total of 100,000, units was given. Next day the bleeding started again and in spite of repeating all the coagulant drugs mentioned above, it became very alarming. 30,000 units of penicillin were given, and the effect was simply marvellous. Within about 15 minutes, the hæmorrhage had entirely ceased. Penicillin injections were repeated every three hours, till a total of 500,000 units was given. Patient has no recurrence of bleeding. Now, how did penicillin act? Could it combat sepsis so quickly? It is hard to imagine. It must have exercised some influence on the coagulation of blood —a very powerful influence, I am inclined to believe. Or would some one say, it was the delayed action of the coagulants! I am etc.

H. M. Desai.

Ahmedabad,
11-2-48.

TOXICITY OF D.D.T.

Sir,—My attention has been drawn to the article "Toxicity of D.D.T." by S. N. Chakravarty M.D. in the January issue of the Journal of the I.M.A. (page 129). He said that the infant of a Captain, who sprayed D.D.T. in a closed room for about 5 to 10 minutes, in which room the infant was sleeping. had developed jaundice and died by the evening. Probably this is not correct that the infant had died of D.D.T. poisoning. There is no definite proof about it as there had been no postmortem examination along with chemical examination to confirm the poisoning.

Chapra district of Bihar has been affected with epidemic of plague for the last two years. The affected houses of plague have been disinfected with 5 per cent D.D.T. in Kerosene oil and 10 per cent D.D.T. dust powder (D.D.T. 1 part and road dust—9 parts). Those houses have been sprayed freely and thoroughly both with 5 per cent D.D.T. in Kerosene oil and 10 per cent D.D.T. dust powder. This operation has been done for the last two years in the district under the supervision of Assistant Health Officers and Health Officer, and about 2 lacs villages have been thus disinfected but not a single case of poisoning has ever been heard although the inmates of the houses live in their houses immediately after operation.

Hope this will find place in your esteemed Journal for circulation. I am etc.

S. K. Samonta.
Assistant Health Officer,
Saran District Board (Bihar).

Chapra,
18-3-48.

REVIEWS

THE PSYCHOLOGY OF THE UNWANTED CHILD—By Agatha H. Bowley. 1947, Crown 8 vo. pp. 112. Published by E. & S. Livingstone, 16 & 17, Teviot Place, Edinburgh. Price 6*s*. net. Postage 5*d*. home.

The best place for the upbringing of a child is the natural home with loving and intelligent parents. Where this ideal arrangement is not available and the child is either truly unwanted or feels himself unwanted in the absence of true love and care from parents, he drifts into various antisocial behaviour—lying, stealing, nocturnal enuresis, wandering, masturbation, destructiveness etc.

In view of her long association with children and her loving care of them, the writer has noticed the workings in the minds of these problem children. She has described the controlled storytelling method as the means to reach there. She has then given suggestions for the avoidance of the development or the removal of such behaviour.

The description is so simple and explicit though giving the psychological workings in the children's minds that the book can be recommended to anybody who has the charge of children at home or boarding institutions—either a parent, a teacher, a nurse or a foster parent.

C. C. Saha.

FOOD AND DIET IN THE MOURYAN EMPIRE—By "Krishi Vala". Pp. 18. Published by Madras Chamber of Agriculture, 16 Broadway, Madras. Price As. 6.

It is a booklet of 18 pages, recounting the state of affairs when food supplies in India were plentiful. During Mauryan times, India's food production was bounteous and this little book attempts to present an interesting but sketchy account of the modes of food productions and distributions, based on a study of Kautilya's Arthashastras written in the fourth century before Christ. Such historical studies should receive encouragement as the outcome is surely to benefit all interested in the present day food problems of India.

H. K. Ray.

CASE STUDIES IN THE PSYCHOLOGY OF CRIME, Vol. II—By Ben Karpman, Second Edition—revised, 1947. Pp. 737. Published by Medical Science Press, Washington, D.C.

This is the second volume of a highly interesting and difficult subject—psychology of crime. We had not the privilege of reviewing the first volume but in this volume the author starts with a general preface to the series of case studies in the psychopathology of crime. Then follows four cases covering 738 pages. The cases are theft of the United States mail, drug addiction, violation of the Mann Act, rape and mail train robbery.

Law should not have the monopoly for treating crimes. Crime is a social problem. It has long been realised that criminality is a psychic illness. It can never be cured by imprisonment or punishment but only by a proper approach to the emotional problems of the individual. The approach and the method adopted in this treatise are mainly of psychodynamics or psychogenetics, an orientation of the form of the original psycho-analytic method and concepts. This consisted mainly—(*a*) psycho-analysis, (*b*) the questionnaire method and (*c*) outside information. When the object is achieved, *i.e.* the sick man is cured it is desirable that the man should be properly received back into his family and from family into the community. In short every opportunity should be given to him to rehabilitate in the community in which he originally lived as an useful member.

The whole volume bears the mark of a thorough and painstaking work. Crime is prevalent all over the world, among rich and poor, slums and sky-scrapers, intelligent and the fool. It has an evil demoralising influence on the community. Social, ethical and individual psychic effects make crime a danger to the society. Unless checked it infects the healthy and normal members. Although it is difficult to visualise crimeless societies, more knowledge regarding the internal causes of crime will be helpful in building a society least conducive to crime. We recommend this book to the medical profession who have direct interest in medicolegal and social problems and also to the Government for developing a new approach to deal with crimes.

B. P. Neogy.

REPORT ON INVESTIGATIONS ON THE MARASMUS SYNDROME IN THE INDIAN SOLDIER FROM THE GENERAL HEAD QUARTERS (INDIA) MEDICAL RESEARCH ORGANISATION (July, 1945—March, 1946). Printed at the Civil & Military Gazette Ltd. Lahore.

This is a report by a Base Research team on the problem of "Marasmus" which caused man wastage in the Indian Army second to Malaria. The greater part of the material for study came from Burma-Malayan theatre of occupation. The rest came from Hong Kong, Canton, and from bases of New Guinea and New Britain. Some 2000 patients were examined and from a study of these the clinical impressions were formed. The main idea of this study was for gaining as much information as possible concerning the ætiology, treatment and prevention of the condition. For this an extensive hæmatological investigation, study of blood chemistry, determination of blood and plasma volume, effect of transfusion of both plasma and whole blood, and fractional test meal were made. Elaborate tables, graphs and histograms illustrate the whole report.

Clinically the cases of marasmus fell under four main groups:

(*a*) Those showing marked wasting but little evidence of specific vitamin deficiency. They had low blood volume and blood pressure and improved with high calorie diet. They constituted 60 per cent of the patients examined.

(*b*) Those showing evidence of severe hypoproteinæmia with œdema and massive anasarca.

(*c*) Those showing syndromes considered to be due to deficiencies of vitamins of the B_2 group.

(*d*) Those showing neurological syndromes such as peripheral neuritis (Beri-Beri), "Captivity Cord syndrome", "captivity amblyopia".

(*e*) Macrocytic (Nutritional) anæmia only.

Other important observations have been made regarding blood chemistry and effect of transfusion on Protein Deficiency. We hope the lessons drawn from this investigation will be utilised in feeding the Army and also used beneficially for civilian diet.

B. P. Neogy.

EXCERPTA MEDICA—Section XII—Ophthalmology, Section XIII—Dermatology and Venereology, Section XIV—Radiology.—General Editors: M. W. Woerdeman, A. P. H. A. De Kleyn and W. P. C. Zeeman. Published by Excerpta Medica Ltd., III Kalverstraat, Amsterdam C., The Netherlands—Agents in United Kingdom—E. & S. Livingstone Ltd., 16-17, Teviot Place, Edinburgh.

With the growth of medical knowledge the periodicals are increasing at an immense rate. Apart from the question of availability and knowledge of various languages the number of publications even in one language despairs the reader. He cannot make time to go through them. Reference of works published in different parts of the world remains unknown to different writers much to the confusion and misunderstanding in the scientific field. The idea of such a publication as Excerpta Medica was realised long ago and its publication will remove a long felt want among the medical profession.

The Excerpta Medica will "provide pertinent and reliable abstracts in English of every article appearing in every Medical Journal in the World". These abstracts will be issued to the public in the form of fifteen separate sectional journals.

The central administration has been set up in Amsterdam under the chief Editorial Board of three members mentioned above. In addition there is a board of Editors for each section. For example there are 34 members in the board for ophthalmology. People from almost every country are represented in these boards from China to Upsala and from Helsingfors to Buenos Aires. The Excerpta Medica, through

the courtesy of the Embassy of the U.S.S.R. in the Hague, has entered into arrangements with Russian Scientific Organisation, to ensure that the work of that country are fully reported. The Excerpta Medica seeks to fill up the gap left by the disappearance of well-known journals like Zentralblälter and Berichte of Berlin. A similar abstracting service exists under the auspices of the B.M.A. We understand that an effort for co-operation in medical abstracts was made in the last session of the UNESCO.

The three sections under review clearly show the high standard of abstracts already reached. Persons who wish to keep pace with the advances in medical science but who are unable to seek the articles themselves, will find Excerpta Medica a reliable source of information.

B. P. NEOGY.

HAND BOOK OF DIAGNOSIS AND TREATMENT OF VENEREAL DISEASE—By A. E. W. McLachlan. Third Edition. Crown 8 vo., pp. 384 with 160 illustrations, 20 in full colour. Published by E. & S. Livingstone Ltd., 16-17 Teviot Place, Edinburgh. Price 15*s*. net.

The third edition of this book has come out within a short time from the second edition. That shows the popularity of the book. It is really a very valuable hand book for the diagnosis and treatment of venereal diseases. In this edition, penicillin treatment in syphilis and gonorrhœa has been added. The author has given his own experiences there and in his opinion, antibiotic treatment alone is not sufficient and particularly in syphilis should be combined with arsenic-bismuth therapy.

The publication will be very helpful to the students and general practitioners who have very little time to go through any voluminous book.

B. N. BANERJEE.

AN INTRODUCTION TO DERMATOLOGY—By G. H. Percival. Eleventh Edition. Demy 8 vo, pp. 362 with 233 clinical illustrations and many photomicrographs. Published by E. & S. Livingstone Ltd., 16-17 Teviot Place. Edinburgh. Price 35*s*. net, postage 9*d*.

The eleventh edition of the book is rewritten by Dr. Percival. In doing so the author has admirably maintained the original aim and tradition of the book. It is an excellent book for the students and practitioners as well. The book is more a practical than a theoretical one. The controversial theories have been avoided, which usually make books voluminous. In doing so, many of the diseases have been dealt with very briefly. Particularly tropical diseases like Leprosy, Dermal Leishmaniasis etc. are very short in their description. The book is full with illustrations and coloured pictures. Printing and quality of paper are very good.

B. N. BANERJEE.

THE ESSENTIALS OF MODERN SURGERY—By R. M. Handfield-Jones and A. E. Porrit. Third Edition, 1948, Royal 8 vo., pp. 1220 with 624 illustrations including many in colour. Published by E. & S. Livingstone, Edinburgh. 16-17 Teviot Place, Edinburgh. Price 50*s*. net.

The present edition is a distinct advancement over its predecessor both in the direction of text and illustrations. The book may well be regarded as a laudable attempt to present the essentials of modern surgery with profuse illustrations, and with excellent summaries, prepared from a painstaking survey of the whole field of surgical literature, so very important for under-graduate students, and young entrants in the profession of surgery.

There has been a very careful sifting of essentials from non-essentials, and from all bewildering details and ambiguities that cast a cloud over the mind of beginners, and a sound surgical knowledge has been judiciously crystallised out of the long experience of fourteen expert collaborators in various fields of surgery.

The real virtue of the book lies in its lucidity. It not merely aims at teaching the text to the students, but by laying out the matter, wherever necessary, in comparative tables, charts and diagrams, it helps them invariably to learn and remember them. Students will simply love it for that reason and will not consider it as one too many in the field of surgical textbooks.

Every section has been brought up to date, in the light and experience of the last war and the latest advances in chemotherapy and general surgery have been incorporated along with a particularly interesting and edifying chapter on The Surgery of the Chest.

The editors, contributors and publishers all deserve unreserved credit and congratulation in their respective spheres of work.

K. K. SENGUPTA.

CURRENT MEDICAL LITERATURE

Prevention of Cardiac Lesions Due to Digitalis

When large doses of digitalis are given to animals daily for a period certain lesions of the myocardium result. It now appears that the administration of aminophylline will prevent the appearance of these lesions; this finding may have a clinical application.

The story begins with Buchner's observation (*Arch exp. Path. Pharmakol,* **176**:59, 1939) in 1934 that the cats treated with large doses of digitalis glucosides show degenerative changes in their heart muscle, particularly in the papillary muscles of the left ventricle, where the muscle undergoes necrosis. Similar observations have been made by later workers (*Clin. Med. J.*, **50**:31, 1936 and *J. Pharmacol.*, **76**:1, 1942). Dearing, Barners, and Essex (*Am. Heart J.*, **25**:648, 1943) found such changes after giving cats an initial dose of digitoxin equal to 0·3 of the lethal dose, followed by daily doses corresponding to 0·3 to 0·6 g. digitalis leaf for a man. They observed degeneration of the myocardial fibres and haemorrhage; exudative cells appeared later, and when these disappeared the connective tissue cells proliferated. Banting and Hall (*Canad. M.A.J.*, **36**:9, 1936 & *Ibid.*, **37**:314, 1937) and their colleagues made two other observations. They gave dogs intravenous injections of 50 mg. acetylcholine by slow infusion into a leg vein. Curiously enough, the effect on the heart rate was acceleration, but the effects on blood pressure, on breathing, and on the intestines were those expected. The blood pressure fell, and there was dyspnoea, cyanosis, salivation, vomiting, and diarrrhoea. These large doses were given daily until the animals died. Their hearts showed permanent damage—hyaline degeneration and some thrombosis in the coronary vessels. Acetylcholine constricts the coronaries, and Banting and Hall suggested that the degeneration was due to this constriction. They produced similar cardiac lesions by chronic stimulation of the vagus (for 31-70 hours) under light nembutal anaesthesia; the heart rate was decreased, but the other effects were the same as those following the injection of acetylcholine. Here again they believed that the myocardial degeneration was due to coronary constriction.

Kyser, Ginsberg, and Gilbert (*Am. Heart J.*, **31**:451, 1946) considered that the myocardial degeneration caused by large doses of digitalis might also be due to coronary constriction, and might therefore be prevented if the digitalis was given together with a powerful coronary-dilator. They gave a digitalis preparation called "digiglusin" to seven dogs for periods varying from 21 to 86 days; in all seven they observed myocardial degeneration. To five dogs they gave digiglusin together with aminophylline (about 80% theophylline and about 12% ethylene-diamine) 3·75 gr. (0·25 g.) twice daily. The hearts of these dogs after 17 to 37 days were almost normal and practically free from degenerative changes. Theobromine sodium acetate protected three out of five dogs but not the other two. Papaverine hydrochloride had no protective action. The evidence suggests that myocardial degeneration does arise from coronary constriction and that theophylline can prevent it when such degeneration is caused by excess of digitalis.—*Brit. M.J.*, **2**:501, 1947).

Dicoumarol in Coronary Thrombosis

Increasing evidence of the value of anticoagulant therapy in the treatment of coronary thrombosis is forthcoming from America. A recent report from the Mayo Clinic is based on a series of 50 cases of acute myocardial infarction admitted to hospital within a few days of onset. (Parkar and Barker—*Proc. Mayo Clin.*, **22**:185, 1947). In 40 cases dicoumarol was used alone, while in the remainder heparin was also given. The plan of dosage was that recommended by Barker *et al.*, (*Surgery*, **17**:207, 1945), wherein the aim is to keep the prothrombin level between 10% and 30% of normal. This was achieved by giving 300 mg. of dicoumarol on the first day and 200 mg. on the second. On each succeeding day if the prothrombin level was greater than 20% or normal 200 mg. was given in a single dose. If the prothrombin level was less than 20% of normal, no dicoumarol was given on that particular day. While an immediate anticoagulant effect is obtained with heparin, there is a lag of 36-58 hours with dicoumarol. The only complications encountered were 1 case of spontaneous hæmorrhage into the knee-joint, which cleared completely, and 1 mild epistaxis; and microscopic hæmaturia was noted in 1 case. The importance of daily estimations of the prothrombin-time is indicated by the finding that in 12 cases the prothrombin level fell to less than 10%, and in 6 of these the intravenous administration of menadione bisulphite was necessary, while in 6 cases the level rose to above 30% for a few days and during this time a second myocardial infarct occurred in one of the patients.

In assessing the results of treatment a series from the same clinic reported by Nay and Barnes (*Am. Heart J.*, **30**:65, 1945) was used as a control: of 100 consecutive cases of acute myocardial infarction, in which anticoagulant therapy was not attempted, thrombo-embolic complications ensued in 37%. In contrast to this, in Parker and Barker's 50 cases, treated with anticoagulants, there were only 2 instances of secondary thrombo-embolic complications. Even more interesting is the observation that in the 2 cases that came to necropsy neither pulmonary emboli nor mural cardiac thrombi were present, whereas pulmonary emboli were found in 5, and mural thrombi in 7, of the 11 cases which came to necropsy in the control series. The mortality-rate was not appreciably different in the two series; 10% in the patients receiving anticoagulant therapy and 13% in the control series. The Mayo Clinic report supports the impression from earlier accounts that dicoumarol is useful in the treatment of myocardial infarctions—*Lancet*, **2**:901, 1941.

Concentrated Aqueous Heparin for Intramuscular Use

Stats and Neuhof (*Am. J.M.Sc.*, **214**:159, 1947) write that concentrated aqueous heparin (100 mg. per cc.) is a new, simple, safe and essentially painless form in which the drug can be administered intramuscularly in order to achieve a desired anticoagulant effect.

Electrocardiogram in Neurocirculatory Asthenia, Anxiety Neurosis or Effort Syndrome

White and others (*Am. Heart J.*, **34**:391, 1947) write that an analysis of the electrocardiograms of 100 cases of

nuerocirculatory asthenia, half soldiers and half civilians, has revealed no characteristic pattern. The few variations from the average normal record are those usually encountered in a group of healthy young men, and either are associated with well-known factors such as body build, pulse rate, and posture, or are the effect of past illness.

One may, therefore, conclude that the electrocardiogram is normal in neurocirculatory asthenia.

Iron Poisoning

Iron tablets are not usually looked on as dangerous. Indeed the average woman seems able to consume six or ten of the common gr. 3 tablets of ferrous sulphate every day for weeks without toxic effects. The pharmacological text books take the same view; "general intoxication due to orally administered iron," say Goodman and Gilman, "is almost unknown." The report by Forbes (*Brit. M.J.*, **1**:367, 1947) last March of two fatalities in young children who had taken ferrous sulphate tablets was a surprise, in spite of the fact that the doses were large. Forbes's first case was a boy of 3¼ years who swallowed 50 tablets of a well-known brand containing gr. 3 of ferrous sulphate together with very small amounts of copper and manganese sulphates; he died 53 hours later and his liver showed evidence of necrosis. The second case was a child aged 1 year who was known to have swallowed 30-35 of the same tablets and died in 30 hours; his liver was not necrotic and aspiration pneumonia following vomiting hastened the end. In May, Thomson (*Brit. M.J.*, **1**:640) reported two more cases of intoxication in children following doses of the same tablets. The first case was fatal; a child of 10 months who had swallowed 39 tablets died in 21 hours and the stomach mucosa was acutely inflamed and necrotic; the liver was not affected. The second child, aged 2 years, obtained only 10 tablets and had vomiting and melaena but recovered. Because of the lack of any firm information Somers (*Brit. M.J.*, **2**:201, 1947) estimated the toxicity of various iron preparations in rabbits, guineapigs, and mice. He soon found that the copper and manganese were not important and that it was these iron that caused the animals to die. Very large doses were needed, but with these the animals died quite quickly in coma or convulsions. The autopsies were disappointing in that no lesion that could account for the deaths was found in the stomach, liver, kidneys, or elsewhere. When these results are applied to men on a dose-for-weight basis it is clear that the average adult would have to swallow some hundreds of gr. 3 ferrous sulphate tablets before there was any danger. But for children the number for a lethal dose is in tens rather than hundreds. Since these tablets are usually dispensed in bottles of 50 or more, an enterprising explorer, mistaking them for sweets, may soon swallow a dangerous dose. These facts have, so far, been hidden in the medical journals, but now the daily press report that the Liverpool coroner had had to consider the death of yet another child, aged 18 months, who swallowed 15-16 tablets. Doctors should therefore warn mothers—and it is usually the mothers who are taking iron—that the tablets must be kept out of reach and are dangerous to children. These fatalities are easily preventable and there should be no more.—*Lancet*, **2**:513, 1947.

Nutritional Aspect of Aging

Rafsky and Newman (*Geriatrics*, **2**:101, 1947) stressed the need for vitamin supplements in the aged. Previous work had demonstrated that apparently normal aged invididuals tended to exhibit, in general, low bolod levels and excretions of thiamine, low blood levels and high tolerance to ascorbic acid, and a high incidence of porphyrinuria which could be made to disappear upon the oral administration of nicotinic acid. Blood levels of carotene and vitamin A were also subnormal.

It was pointed out that by chemical analysis the food in the diet contained an ample supply of vitamins according to the standards of the National Research Council. Tests indicated that relatively normal rates of assimilation and absorption of the vitamins existed. The question of proper physiological utilization of the vitamins is being investigated. From this study the authors felt that the vitamin requirements of normal elderly people cannot be measured in terms of standards applicable to young adults or children and that the problem is either a physiological one or one of ialty utilization. They stated that irrespective of the cause, the diets of old people must be supplemented by vitamin therapy and that comparatively large amounts should be prescribed.

Electronarcosis: A New Treatment of Schizophrenia

Paterson and Milligan (*Lancet*, **2**:198, 1947) give in the following lines the summary of their observations:

The physiological state known as electronarcosis is described in dogs and in man.

Any current capable of stimulating the central nervous system could be used to produce narcosis. The stimulation however, must be prolonged. For this either a pulsating or an alternating current is effective, whereaas a direct current is not. The machine used gave a current of constant intensity because change in the resistance of the organism were automatically compensated by a special device. It was found advisable to give a relatively strong current to begin with (300 out of a 60-cycle alternating current, to make the animal unconscious from the start).

It has been claimed in America that electronarcosis is as successful as insulin-coma therapy in treating schizophrenia.

A new portable machine is described, in which a constant current is obtained without the use of thermionic valves.

We have treated 20 scizophrenics, in most cases with 12 treatments in one month.

Though it is as yet too early to assess the results of treatment the results are distinctly promising.

Owing to the simplicity and relative safety of electronarcosis, it may possibly take the place of insulin-coma as the treatment of choice for early schizophrenia.